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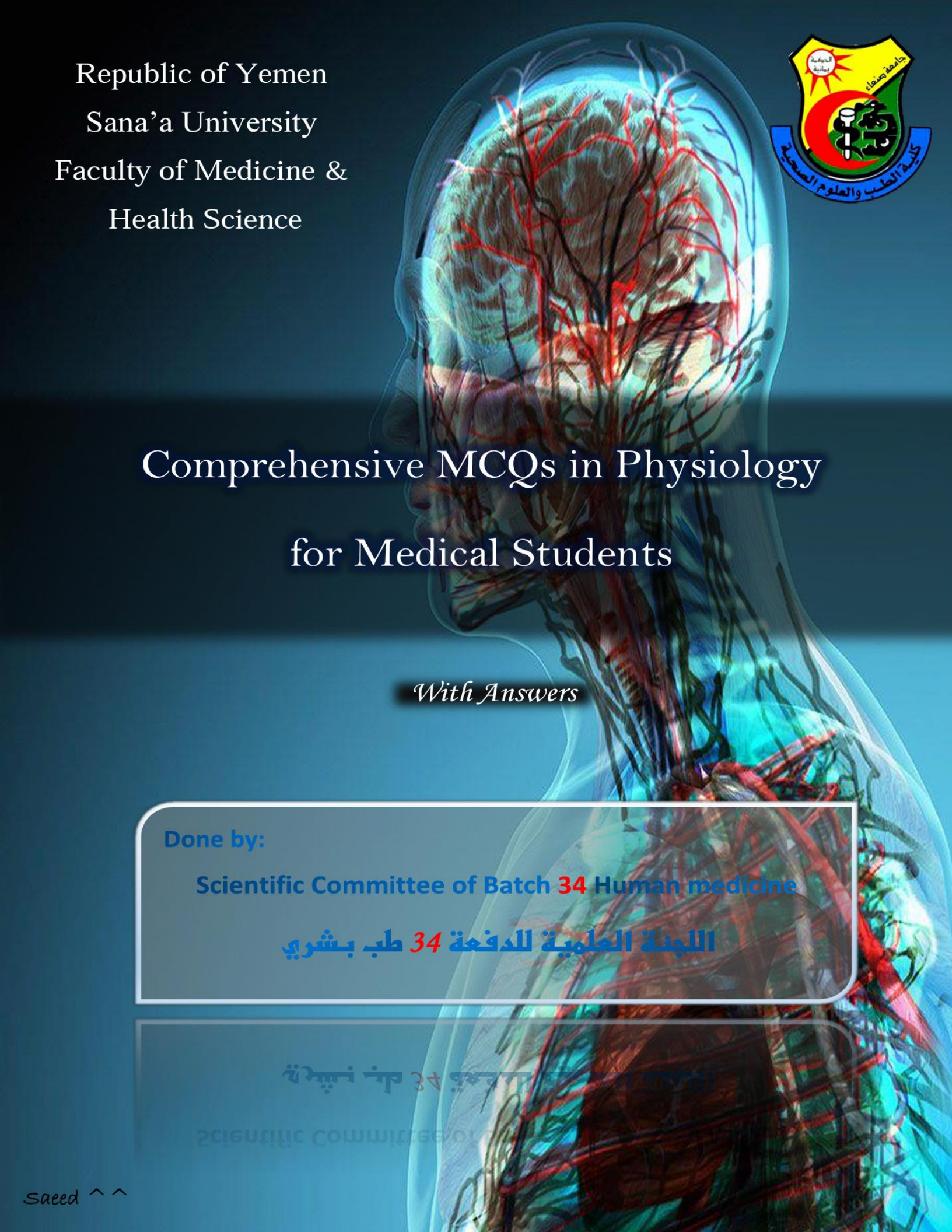


Comprehensive MCQs in Physiology for Medical Students

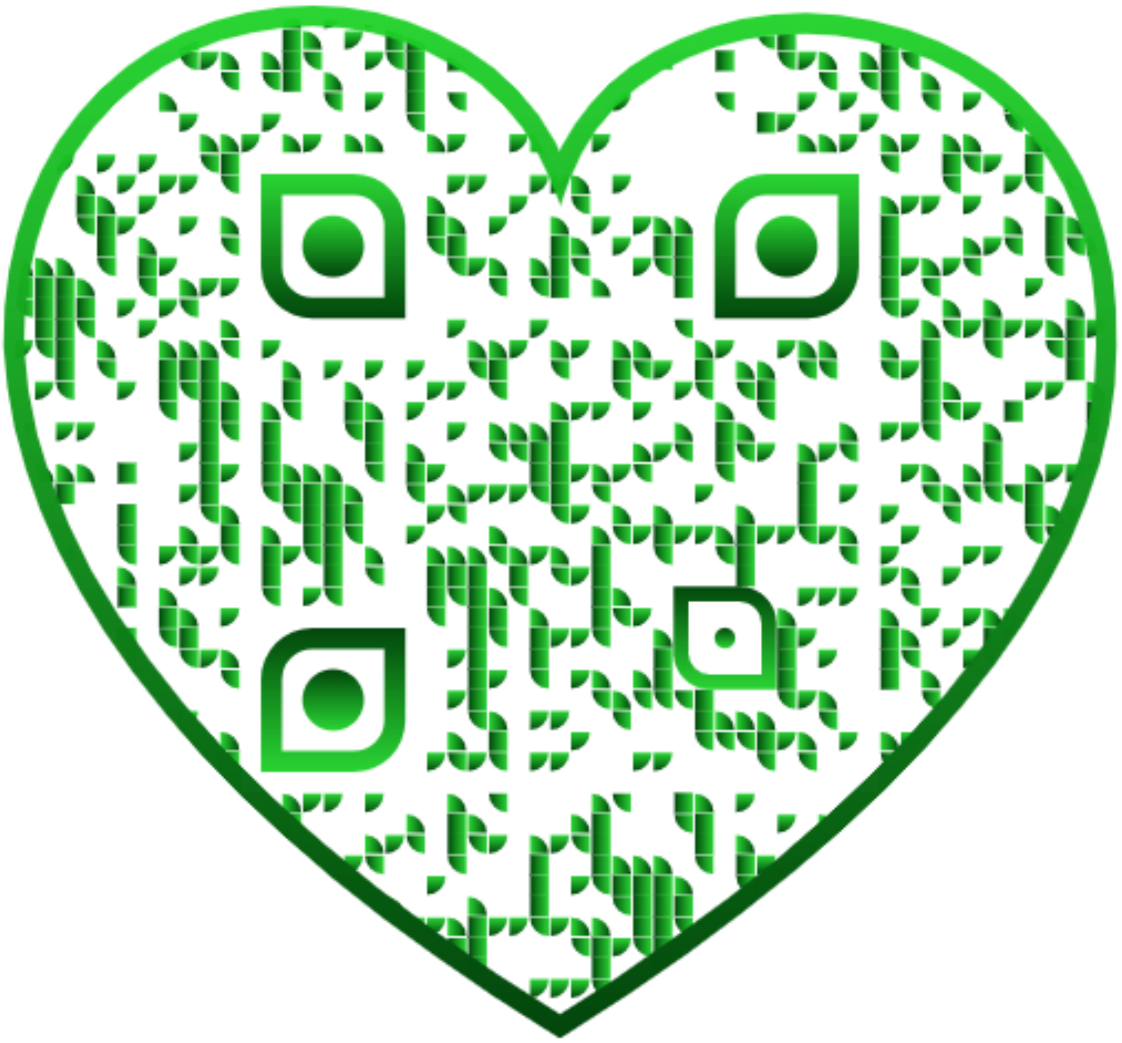
With Answers

Done by:

Scientific Committee of Batch 34 Human medicine

اللجنة العلمية للدفعة 34 طب بشري

Saeed ^ ^



بسم الله الرحمن الرحيم

الحمد لله وحده والصلاة والسلام على من لا نبي بعده وعلى آله وصحبه أما بعد.

أولاً وقبل أي شيء نتقدم بالشكر الجزيل لكل شخص أعطى من وقته وجهده من أجل أن يرى هذا العمل النور ومن أجل أن تصل ثمرته لمن أراد أن ينتفع به، لمن جعلوا العطاء منهجا واتخذوا التعاون سبيلا، لمن يأبون أن تمر الحياة دون أن يضعوا بصمة.

ثانياً يضم هذا الكتاب في محتواه أسئلة بصيغة ال MCQ لمادة الفسيولوجي مع إجاباتها بالإضافة إلى تفسيرات لمعظمها من أجل توفير الوقت والجهد على الطالب، قام بتجميعها وإعدادها مجموعة من الطلاب في اللجنة العلمية للدفعة 34 طب بشري.

وفي الأخير نرجو من الله عزوجل أن يُنتفع بهذا الكتاب وأن تُحقق أهدافه ونستسمحكم عذراً عن أي خطأ أو تقصير فالكمال لله وحده، وفقنا الله وإياكم لما يحب ويرضى.

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Cardiovascular System

1- Which of these statements is false:-

a- most of total blood volume is contained in veins

b- Capillaries have a greater total surface area than any other vessels

c- Exchange between blood and tissue fluid occur across the wall of venules

d- Small arteries and arterioles present great resistance to blood flow

Answer: C

2- All arteries in the body contain oxygen-rich blood with exception of:

a- The aorta

b- The pulmonary artery

c- The renal artery

d- The coronary arteries

Answer: B

3- The first heart sound is produce by closing of:

a-aortic semilunar valve

b- pulmonary semilunar valve

c- tricuspid valve

d- Bicuspid valve

e- Both AV valves

Answer: E

4- The first heart sound is produced at:

a- The beginning of systole

b- The end of systole

c- The beginning of diastole

d- The end of diastole

Answer: A

5- The QRS wave of ECG is produced by:

a-Depolarization of atria

b- Repolarization of atria

c- Depolarization of ventricles

d- Repolarization of ventricles

Answer: C

6- The second heart sound immediately follows the occurance of:

a- P wave b- QRS wave

c- T wave

Answer: C

7- The cell that normally have the fastest rate of spontaneous diastolic depolarization are located in:

a- SA node b- AV node

c- Bundle of His d- Purkinje fibers

Answer: A

8- Loss of the elasticity of the arterial wall:

a- Rises the diastolic arterial pressure

b- Increases the peripheral resistance

c- Rises the systolic arterial pressure

d- Decreases the velocity of arterial pulse wave

Answer: C

9- The increasing in the blood flow to a rhythmically excersing muscle depend on:

a- Release of sympathetic vasoconstrictor

b- Active dilation of capillaries

c- Vasoconstriction in vascular bed adjacent to excersing muscle

d- Metabolites produced in the excersing muscle

Answer: D, the cause during exercise the active muscles have hypoxia so, release metabolites as vasodilators which do vasodilation on vessels of active muscle as adenosine

10- The end-diastolic volume of left ventricle :

a- Is reduced in the aortic valve stenosis

b- Is reduced in the mitral valve stenosis

c- Is reduced during inspiration

d- depends entirely on the contraction of the left atria

Answer: C

11- A ventricular extrasystole:
a- Is associated with normal QRS
b- Tend to be followed by by compensatory period
c- Caused by increase SAN activity
d- Always produces a pulse at the wrist
Answer: B

12- Hypertension is may be caused by:
a- Hypoxia due to chronic respiratory failure
b- Hypertrophy of left ventricle
c- Excessive secretion of aldosterone
d- Excessive muscle exercise
Answer: C

13- Starling law of heart:
a- Dose not operate in failing heart
b- Explain the increase in HR produced by exercise
c- Explain the increase in CO that occurs when venous return is increased
d- Explain the increase in CO when sympathetic cardiac nerves are stimulated
Answer: C

14- In second degree heart block:
a-The ventricular rate is slower than the atrial rate
b- The ventricular electrocardiographic complexes are distorted
c- Stroke volume is decreased at rest
d- Cardiac output in increased at rest
Answer: B

15- Ventricular filling:
a- Is reduced of aortic valve is stenosis
b- Depends entirely on contraction of atria
c- Is reduced if the mitral valve is stenosis

d- Gives rise to second heart sound
Answer: C

16- The greatest amount of ventricular filling occurs during:
a- The first one third of diastole
b- The middle one third of diastole
c- The last one third of diastole
d- The ventricular systole
Answer: A

17- Second degree of heart block:
a- Is caused by wandering atrial pacemaker
b- Usually involve retrograde conduction to atria
c- Always involve a lost ventricular depolarization every so many P waves
d- Most of QRS complexes are wide and bizarre
Answer: C

18- Stimulation of cardiac adrenergic sympathetic neurons:
a- Increase P-R interval of ECG
b- Decrease the delay at the AV node
c- Decrease the stroke work of ventricles
d- Increase the end-systolic volume of ventricles
Answer: B

19- Which of the following is the most common cause of an increase Coronary blood flow:
a- Decreased coronary perfusion pressure
b- Increased diastolic ventricular pressure
c- Increased stimulation of alpha adrenergic receptors in the heart
d- Increased stimulation of beta adrenergic receptors in the heart
Answer: C

20- Cardiac output:
a- Is usually expressed as the combined output of left and right ventricles per minute

b- Increases mainly when the heart rate is very high
c- Rises when the subject changes from standing to lying down position
d- Is reduced reflexly in a hot environment
Answer: C

21- in atrial fibrillation :

a- sinus arrhythmia commonly occurs.
b- the ventricular rate is usualy determined by a ventricular pace maker.
c- P wave usually absent from the ECG.
d- the ECG show no evidence electrical activity in the atria .
Answer: C , in atrial fibrillation there is no P wave and are replaced by fine oscillations called F waves and the QRS and T waves are normal in shape but irregular in rate .

22- During cardiac cycle :-

a-myocardial contraction begin in left atrium .
b- myocardial contraction begin in right atrium .
c- the atria contract when the mitral and tricuspid valves are closed.
d- excitation of epicardial myocardium precedes excitation of endocardium.
Answer : B, the SA node which generate impulse spontaneously is located in the right atrium then conduct impulses to the left atrium by intrenodal system ((ant. mid. and post. internodal tracts)).

23- During the transmission of action potential through conducting system of the heart ,there is a temporary delay at :-

a- AV-bundle . b- SA node
c- purkinje fibers. d- AV node.
Answer : D, there is a delay in AV node by 0.1 second , that due to 2 factors 1- nodal muscle fibers are small in size and poor in gap junctions , so they are slowly - conducting 2- th special characteristic of N region of AV node.

24- increased venous return resualt in :-

a- increased end systolic volume. b- increased end diastolic volume.
c- increased atrial pressure. d- increased peripheral resistance .
Answer : B, increase venous return lead to increase atria pressure which leads to increase end diastolic volume .
decrease venous return lead to decrease atrial pressure which leads to decrease end diastolic volume.

25- because of the baroreceptors reflex, whan normal arterial pressure decrease, the:
a- heart rate decreases. b- stroke volume decreases .
c- frequency of afferent action potential from baroreceptors decrease .
d- cardioregulatory center stimulate parasympathetic nervous system.
Answer : C, baroreceptors are located in aortic arch and carotid sinus and they oppose the changes in the arterial blood pressure by the reflexes eg:- when the ABP decrease the discharge rate from baroreceptors will decrease lead to decrease the activity of CIC and VDC.

26- the resistance to blood flow is greatest in the :-
a-aorta b- arterioles. c- capillaries. d- venules.
Answer : B, arterioles are muscular high resistance vessels which regulate blood flow to tissue and maintain ABP.

27- both ADH and aldosterone act to :-
a- Increase urine Volume. b- increase blood volume.
c- Increase tottal peripheral resistance. d- produce all of these effects.
Answer : B, ADH increase water reabsorbtion which lead to increase blood volume.
Aldosterone increase Na and water reabsorbtion which lead to increase blood volume.

28- the sound of korotkoff are produced by :-
a- closing of semilunar valves. b- closing of AV valves.
c- the turbulent flow of blood through an artery. d- elastic recoil of aorta .
Answer : C, the turbulent flow of blood through an artery produce korotkoff sound .

29- an increase in blood volume will cause :-
a- a decrease in ADH secretion. b- an increase in Na excretion in the urine .
c- a decrease in renin secretion. d- all of these .
Answer : D, increase in blood volume cause all of the above effects.

30- during the phase of the isovolumetric relaxation of the ventricles,the pressure on the ventricles is:-
a- rising. b- falling. c- first rising, then falling. d- constant.

Answer : B, the ventricular pressure is rising in isometric contraction phase, maximum ejection phase and start to decrease in reduced ejection phase and isometric relaxation phase then start to increase in maximum filling phase and reduced filling phase.

31- according to Frank-Starling law of the heart , the strength of ventricular contraction :-

a- directly proportional to the end-diastolic volume.
b- inversely proportional the end-diastolic volume.
c- independent of end diastolic volume.
Answer : A, Frank-Starling law "with in limits ,the force of myocardial contraction is directly proportional to the initial length of cardiac muscle fibers ".

32- edema is caused by :-

a- high blood pressure.
b- Decrease plasma protein concentration.
c- leakage of the plasma proteins into interstitial fluid.
d- blockage of lymphatic vessels.
e- all of the above.
Answer :E, edema is caused by increase in hydrostatic pressure by increase blood pressure and decrease in osmotic pressure by decrease in plasma proteins concentration also caused by in adequate lymph drinage.

33- the volume of blood pumped per minute by the left ventricle is :-

a- greater than the volume pumped by the right ventricle.
b- less than the volume pumped by the right ventricle.
c- the same as the volume pumped by the right ventricle.
d- either less or greater than the volume pumped by the right ventricle depending on the strength of the contraction.
Answer is : C, CO= the volume of blood pumped from each ventricle per minute so cardiac output of Right ventricle = Left ventricle .

34- blood pressure is lowest in :-

a- arteries. b- arterioles. c- capillaries.
d- venules. e- veins.
Answer : E, blood pressure is high in arteries and low in veins .

35- stretch receptors in the aortic arch and the carotid sinus :-

a- stimulate secretion of atrial natriuretic peptide.
b- serve as a baroreceptors that affect activity of vagus and sympathetic nerve.
c- serve as osmoreceptoes that stimulate the release of ADH .
d- stimulate renin secretion, thus increasing angiotensinogen II formation.
Answer : B, aortic arch and carotid sinus are arterial baroreceptors witch maintain the arterial bloodpressure by provid the nervous system with information about the level of ABP by the effect the activity of vagus and sympathetic nerves.

36- Angiotensinogen ll :-
a- stimulate vasoconstriction b- stimulate the Adrenal cortex to secret aldosterone.
c- inhibit the action of bradykinine. d- all of the above.
Answer : D, angiotensinogen ll produced in the lungs by the action of angiotensinogen converting enzyme ACE on the angiotensinogen l which increases the ABP by all of the previous actions .

37- the pulse pressure is measure of :-
a- the number of heart beat per minute. b- the sum of diastolic and systolic pressures.
c- the difference between the systolic and diastolic pressures .
d-the difference between the arterial and venous pressures .
Answer : C, pulse pressure =systolic pressure (120) - diastolic pressure (80) = 40.

38- which part of ECG corresponds to ventricular repolarization :-
a- the P wave. b- the QRS complex. c- the T wave. d- the U wave .
e- the P-R interval.
Answer : C .

39 - Which of the following normally has a slowly depolarizing “pre-potential”:
a - sinoatrial node b - atrial muscles cells c - bundle of his
d - purkinje fibers e - ventricular muscle cells
Answer: A, the fast response “depolarization” occur in ventricle, His-purkinje system and Atria ‘coz they are rich in gap junction. The slow response “depolarization” occur in S-A node and A-V node ‘coz they are small in size and poor in gap junction.

40 - Currents are caused by opening of which of the following channels contribute to the repolarization phase of the action potential of the ventricular muscles fibers:

a - Na channels b - Cl channels c - Ca_2 channels

d - K channels e - HCO_3 channels

Answer: D, the action potential of ventricular muscles fibers is fast response, the depolarization phase is caused by Na influx. The pleatve is caused by Ca_2 influx and K efflux, and the repolarization phase is caused by K efflux.

41 - In second degree of the heart block:

a - the ventricular rate is lower than atrial

b - the ventricular ECG complex are distorted

c - there is a high incidence of ventricular

d - stroke volume "SV" is decreased

e - cardiac output "CO" is increased

42 - The forth heart sound is caused by:

a - closure of aortic and pulmonary

b - vibrations in the ventricular wall during systole

c - ventricular filling

d - closure of mitral and tricuspid valves

e - retrograde flow in the vena cave

Answer: C, 1^{st} sound → produced by closure of AV valves

2^{nd} sound → produced by closure of semilunar valves

3^{rd} sound → produced by oscillation of rushing blood from atria into ventricles

4^{th} sound → produced by ventricular filling.

43 - The dicrotic notch on the aortic presser curve is caused by:

a - closure of mitral valve

b - closure of tricuspid valve

c - closure of aortic valve

d - closure of pulmonary valve

e - rapid filling of left ventricle

Answer: C, the dicrotic notch is caused by small oscillation on the downslope of aortic valve, and is followed by dicrotic wave.

44 - The work performed by the left ventricle, 'coz in the left ventricle:

a - the contraction is slower

b - the wall is thicker

c - the stroke volume is greater
d - the preload is greater
e - the after-load is greater

45 - Which of the following has the highest total cross-section area in the body:
a - arteries b - arterioles c - capillaries
d - venules e – veins
Answer: C

46 - The pressure in capillary in skeletal muscle is 35 mmHg at the arteriolar end and 14 mmHg at the venular end, while the interstitial presser is zero mmHg. The colloid osmotic pressure is 25 mmHg in capillary and 1 mmHg in the interstitium. The net force producing fluid movement across the capillary wall at its arteriolar end is:
a - 3 mmHg out of the capillary
b - 3 mmHg into the capillary
c - 10 mmHg out of the capillary
d - 11 mmHg out of the capillary
e - 11 mmHg into the capillary
Answer: D, The net force = pressure favor filtration - pressure favor reabsorption
= (35 + 1) - (0 + 25) = 36 - 25 = 11
the pressure favor filtration more than reabsorption so will be out of the capillary

47 - Which of these organ is able to tolerate the greatest reduction in blood flow:
a - brain b - heart c - skeletal muscles d - skin
Answer: D, 1st organ sensitive to hypoxia “Brain”
2nd organ sensitive to hypoxia “Heart”
3rd organ sensitive to hypoxia “Kidney”

48 - Which of these is a paracrine regulator that stimulates vasoconstriction:
a - nitric oxide “NO” b - prostacyclin
c - bradykinin e - endothelin-1
Answer: D, some vasodilator metabolites bradykinin, nitric oxide, adenosine, prostacyclin and others. Some vasoconstrictor substances as; prostaglandin, histamine, serotonin and endothein-1.

49 - An ischemic injury to the heart that destroys myocardial cells is:
a - angina pectoris b - a myocardial infarction

c - fibrillation d - heart block
Answer: B

50 - The windkessel effect has the greatest influence on magnitude of the pulse presser in thee:
a - Aorta b - capillary c - venules d - veins
Answer: A

51 - Neck vein pulsation due to:
a - atrial systole b - atrial diastole
c - peripheral resistance "PR" d - none of the above

52 - When moving from supine to erect position:
a - mean arterial presser increase
b - skin perfusion immediately decrease
c - cardiac output increase
d - TPR increase

53 - The slowest conduction occurs in:
a - atrium b - AV node
c - bundle of His d - purkinje fibers
Answer: B

54 - Baroreceptors are located in all; Except:
a - Aortic sinus b - Aortic bodies
c - Carotid sinus d - Aortic arch

55 - sympathetic stimulation of the heart will increase:
a - cardiac output
b - coronary blood flow
c - all of the above

56 - All are function of the CVS; Except:
a - linked to other system
b - nutrients absorption
c - involved in gas exchange
d - its whole blood easy going to flow

57 - Arteries differ from veins by:

a - moving toward the heart
b - have strong vasoconstriction
c - where gas exchange takes place
d - have elastic fiber and circular smooth muscle

58- Causes of edema all, except

a. Increase blood hydrostatic pressure
b. Decrease blood osmotic pressure
c. Leaking cap wall
d. Decrease interstitial and lymphatic pressure

Answer D; see causes of edema on Magdi Sabry, page 123.

59- Vasodilation of arteriole peripherally by

a. Decrease tissue activity
b. Decrease CO2
c. Decrease lactic acid
d. Decrease O2

Answer D; Vasodilation of arterioles occur in hypoxia, increased metabolic activity and whenever releasing vasodilator metabolites as adenosine, lactic acid, K and others.

60- At rest the source of energy for cardiac muscle

a. Glycogen
b. CHO
c. Fat
d. B.C

Answer C; heart mainly FA 60%, glucose 20% and lactate 20% as a source of energy during rest, but during exercise it uses lactate as source of energy.

61- All happened during muscle exercise except

a. Increase heart rate
b. Increase stroke volume
c. Increase venous return
d. Decrease blood flow to active mechanism

Answer D; see effects of exercise on circulation, page 141.

62- Which is false about neural regulation of ABP

a. Center located in pons
b. VMC or presser area
c. CIC or depressor area
d. Autonomic nerve fibers

Answer A; cardiovascular center is located in medulla oblongata and include CIC ''depressor" its stimulation lead to bradycardia, VMC "presser" its stimulation lead to vasoconstriction or vasodilation.

63- Factor affect B.P more than other

a. F > M
b. Children > elderly
c. Sleep > exercise
d. Pregnancy and hyperthyroidism

Answer D; BP is increase in pregnancy due to increase cardiac output due to increase uterine blood flow and increase in hyperthyroidism due to increase cardiac output and systolic blood pressure.

64- The shifting upward and to the left of frank-sterling law or ventricular function curve may result from

a. Decrease heart rate
b. Increase intropicity and catechol amines
c. Increased venous return to heart
d. Heart failure

Answer B; this curve showing the relation between EDV and ventricular performance and if it shifting upward and to left, it shows the effect of positive inotropic factors.
If it shifting downward and to the right, it shows the effect of negative inotropic factors

65- The Sino-atrial node

a. But not atrio-ventricular node receives parasympathetic nerve supply
b. Is connected by thin band of porkinje tissue with A.V node
c. Pacemaker cells undergo a faster rate of diastolic depolarization at 39 C then at 37C
d. Pacemaker cells undergo a faster rate of diastolic depolarization in the presence of acetylcholine

66- When the radius of the resistance vessels is increased which of the following is increased, which of the following is increased

a. Systolic blood pressure
b. Diastolic blood pressure
c. Viscosity of blood
d. Hematocrit
e. Capillary blood flow

Answer E; R= 8Ln/ t r4

R; resistance L; length of vessels n; blood viscosity t; 3.14 r; radius

↑radius→↓PR→↓BP

67- Which of the following dose not dilate arterioles in skin

a. Increased body temperature
b. Epinephrine
c. Brady kinine
d. Substance p
e. Vasopressin

Answer E

68- All the following increase excitability except

a. ↓Ca
b. ↓O2
c. ↑Temperature
d. Thyroxin

Answer B; excitability is increased in hypocalcaemia in moderate increase body temperature.

69- Decrease in blood pressure lead to

a. ↑Renin
b. ↓Aldosterone
c. ↓Angiotensin

Answer A; as ↓BP→ ↑Renin→ ↑Aldosterone→ ↑Na and water retention→↑BP

↓

↑ angiotensin→ V.C→ ↑ BP

70- Decrease elasticity of aorta lead to

a. Increase PR

b. Decrease blood viscosity
c. Increase systolic pressure
d. Increase diastolic pressure

71- Sino atrial node cells are

a. Found on both atria
b. Innervated by somatic nerve
c. Unable to generate impulses when completely innervated
d. Innervated by vagus nerve

Answer D; Sino atrial node is the pacemaker of the heart, which is located in the right atrium and it, generate impulses spontaneously and innervated by both sympathetic and parasympathetic system.

72- The strength of left ventricle contraction increase when

a. Increased end diastolic volume
b. Hyperkalemia
c. Hypocalcaemia
d. Strenuous exercise has no effect

73- Which stimulate chemoreceptor

a. Hemorrhage
b. Circulator shock
c. Hypoxia
d. All of the above

Answer D; chemoreceptor reflexes are stimulated when ABP below 60mmHg and on hypoxia mainly the peripheral chemoreceptor. The center chemoreceptor is stimulated by hypercapnia

74- Effect of sympathetic stimulation on pacemaker potential

a. To be faster
b. To be slower
c. Decrease heart rate
d. B and c

Answer A; sympathetic stimulation lead to increase all properties of heart.

75- Sympathetic drive to the heart will increase

a. Blood flow to coronary arteries
b. Purkinje fibers conduction

c. Ejection fraction of left ventricle
d. All of the above

Answer d; sympathetic stimulation of the heart lead to increase all properties of the heart by stimulation the pacemaker.

76- Cardiac output

a. Expressed as the product of one ventricle in L/min
b. Increased when heart rate increase in all situations
c. Dose not increase in exercise following denervation of heart
d. Decrease when laying down

Answer C; may be due to absence the sympathetic activity.

77- In denervated heart, lift ventricular stroke work increase when

a. Increase blood volume
b. Increase venous return
c. Increase end diastolic volume
d. All of the above

Answer D; increase blood volume lead to increase venous return so increased EDV so increased stroke volume.

78-The nerve supply to the heart as follow

a. SA node is innervated by sympathetic only
b. Atrial is innervated by both sympathetic and barasympathetic
c. Rt vagus supply SA node and A.V node
d. Lift vagus supply SA node
e. Parasympathetic supply ventricular muscle

79- The heart rate is increased by all the following except

a. Fever
b. Increased venous return
c. Atropine
d. Hypothyroidism
e. Adrenaline

Answer D ; Fever, Atropine, Adrenaline, venous return and thyroxin increase heart rate so Hypothyroidism decrease heart rate.

80-Stroke volume

a. Increase as a result of increased after load
b. Equal end diastolic volume minus end systolic volume
c. Increases as heart rate increased by electrical pacing
d. Increased by parasympathetic stimulation
e. Increased by Ca channel blocks

Answer B; stroke volume is the volume of the blood that pumped at each ventricle per beat and it is equal the difference between EDV and ESV.

81- The chemoreceptor are found in

a. The lung
b. Glomus body
c. Aortic arch
d. Carotid sinus
e. Medulla

Answer E; the center chemoreceptor are located in medulla and the peripheral chemoreceptor are located in aortic and carotid bodies.

82-The vessel responsible for regulation of blood pressure

a. Medium size arteries
b. Small veins
c. Capillaries
d. Venoles
e. Arterioles

Answer C; as the answer of Q26

83- Which of the following substances will be most likely to dilate systemic arterioles

a. Endothelin
b. ADH
c. Histamine
d. Noradrenaline
e. Aldosterone

84-In the heart, within physiological limits the force of contraction is directly proportional to

a. Pacemaker activity
b. AV node delay

c. Initial length of cardiac muscle
d. Respiratory rate
e. Vagal stimulation

85- The volume of blood is greatest in

a. Systemic capillaries
b. Veins
c. Arteries
d. The spleen
e. The heart

Answer B; blood volume in systemic veins 54%, in heart 12% in arterial system 11% in capillaries 5% and in pulmonary vessels 18%.

86-Cardiac output divided by heart rate equals to

a. Cardiac index
b. Cardiac efficiency
c. Mean arterial pressure
d. Stroke volume

Answer D; CO= SV*HR …… so CO/HR= SV

87-At rest the lift ventricular end systolic volume is

a. 10ml
b. 30ml
c. 50ml
d. 120ml

Answer C; EDV= 130ml……..ESV=50ml……SV(stroke volume)= EDV-ESV= 130-50=80ml

88-Cardiac muscle has a long refractory period because

a. The impulse take about 0.2 s to travel from SA to AV node
b. It obeys to all-or-none law
c. Of the delay in Na influx
d. Of Ca influx

Answer D; the refractory period of cardiac muscle is longer than that of skeletal muscle due to presence of plateau, which is due to Ca influx

Respiratory System

1- Which of the following is NOT a function of the lungs?

a- Metabolism

b- Serves as a reservoir of blood from the Rt atrium.

c- It is a filter to protect the systemic vasculature

d- Facilitates the exchange of O2 and CO2 between air and blood

Answer: b, the lungs receive blood from Right ventricle not Right atrium

2- Gas exchanging occurs firstly at

a- Terminal bronchioles

b- Respiratory bronchioles

c- Segmental bronchi

d- Alveoli

Answer: b, the respiratory bronchioles contain some alveoli

3- In air flow obstruction the FEV1/FVC

a- Same as normal

b- More than normal

c- less than normal

d- 90%

Answer: c, the FEV1 decreases to a great extent in obstructive lung disease

4- During inspiration all are true except

a- The rips move upwards

b- The diaphragm lifts up

c- The anterio-posterior dimension of the chest is increased

d- The transverse dimension of the thorax is increased

Answer: b, the diaphragm moves downwards during inspiration to decrease the intrathoracic pressure which helps the air to move in.

5- During inspiration

a- Alveolar pressure is less than atmospheric

b- Alveolar pressure is greater than atmospheric

c- Alveolar pressure is the same as atmospheric

d- Alveolar pressure is 1mmHg

Answer : a, alveolar pressure becomes lower than the atmospheric during inspiration so the air flows in.

6- In Hb-O2 association curve, which is false?

a- Increase P50 means O2 binds less tightly to Hb

b- Increase in PCO2 shifts it to the right
c- Increase 2,3-DPG shifts it to the left
d- Decrease in PH increases PCO2

Answer: c, increase 2,3-DPG shifts the curve to the right not to the left

7- CO2 can be transported in the blood

a- As bicarbonate
b- Dissolved in the blood
c- Bound to the amino end groups in proteins
d- All of the above

Answer: d, it can be in all forms mentioned above

8- Which of the following is the primary regulating variable of the central chemoreceptors?

a- PaO2
b- PaCO2
c- Arterial pH
d- A,B and C

Answer: a, the only gas that can excite the central chemoreceptors is CO2 by increasing H^+ in the brain fluids

9- Regarding the peripheral chemoreceptors, which respond is true?

a- Respond to a rise in PaO2
b- Respond to a fall in PaCO2
c- Respond to respiratory alkalemia
d- Are in the carotid and aortic bodies

Answer: d, the peripheral chemoreceptors are located in the aortic and carotid bodies.

10- If dead space is one third of the tidal volume and arterial PCO2 is 45mmHg, the mixed expired PCO2 is

a- 20mmHg
b- 25mmHg
c- 30mmHg
d- 45mmHg

Answer : c, Expired PCO2 = (TV-DS) arterial (alveolar) PCO2 / TV

11- In pulmonary embolism

a- Ventilation/perfusion ratio infinite number
b- The PaO2 would be greater than normal

c- The PaCO2 would be 0
d- All of the above
Answer: a, the V/P ratio will not be altered because both ventilation and perfusion will not be affected

12- Concerning the ventilation and perfusion of different regions of the lung?

a- Alveoli at the top of the lung are better ventilated
b- The Hb moving through the base of the lung is less saturated than that at the apex of the lung
c- Ventilation/perfusion ratio at the apex of the lung is better than at the base of the lung
d- All of the above
Answer: d, ventilation at the apex of the lungs is better, Hb at the base is less saturated because V/P ratio is less at the base of the lungs

13- The expired volume of air after taking maximum inspiration and expiring maximally

a- Vital capacity
b- Residual volume
c- Total lung capacity
d- Forced expiratory volume at first second
Answer: a

14- Central chemoreceptors

a- Part of CSF
b- Respond to increase in CSF pH
c- Respond to decrease in PaO2
d- Located in medullary respiratory center
Answer: d

15- For surfactant, which is true?

a- Decreases the surface tension of the alveolar fluid
b- Increase the compliance of the lung
c- Is produced by type II pneumocytes
d- All of the above
Answer: d

16- The Hering-Breuer reflexes orginate from the:

a- Chemoreceptors in the lungs
b- baroreceptors
c- Carotid and aortic lungs

d- Mechanoreceptors in the lungs

Answer: D, the Hering-breuer reflexes are affected by the inflation and deflation receptors in the lungs.

17- In ascending to high altitudes a person is likely to develop

a- a fall in arterial pH

b- a rise in arterial $PaCO_2$

c- a fall in arterial PaO_2

d- a decrease in red blood cells count

Answer: c, because inhalation becomes harder in high altitudes (low atmospheric pressure)

18- the inspiratory center

a- is situated in the midbrain

b- sends out regular impulses to the inspiratory muscles during quiet respiration

c- sends out regular impulses to the expiratory muscles during quiet respiration

d- is stimulated by swallowing and vomiting

Answer: b, inspiration is an active process which needs the movements of the muscles unlike expiration

19- the lungs do not normally collapse because of

a- surfactant

b- intrapleural pressure

c- elastic recoil

d- both a and b

Answer: d, both surfactant and intrapleural pressure prevent the lung from collapsing by increasing the compliance of lungs

20- the rate of diffusion of a gas across the pulmonary membrane increases as the

a- pulmonary membrane becomes thicker

b- surface area of the pulmonary membrane decreases

c- partial pressure gradient of the gas across the pulmonary membrane increases

d- diffusion coefficient of the gas decreases

Answer: c, the rate of diffusion is directly proportional to the pressure gradient.

21- the partial pressure of the carbon dioxide in the venous blood is

a- greater than in the tissue space

b- less than in the tissue space

c- less than in the alveoli

d- less than in the arterial blood

Answer: b, the PaCO2 is less in tissues due to the diffusion of CO2 to the venous blood in order to be excreted.

22- the oxygen-hemoglobin dissociation curve is adaptive because it

a- shifts to the right in the pulmonary capillaries and to the left in the tissue capillaries

b- shifts to the left in the pulmonary capillaries and to the right in the tissue capillaries

c- Linear shape

d- Does not shift

Answer: b, the affinity of hemoglobin to oxygen is higher in the pulmonary capillaries that is why it shifts to the left.

23- Metabolic functions of the lung include all of the following EXCEPT?

a- Synthesis of surfactant

b- Synthesis of prostaglandins

c- Inactivation of bradycinin

d- Inactivation of angiotensin II

Answer: d

24- When CO2 diffuses into blood in systemic capillaries most of it

a- Remains in solution as CO2

b- Converts to carbamino compounds

c- Converts to bicarbonate ions in RBCs

d- Combines with Hb directly

Answer: c, 90% of the total amount of CO2 in the arterial blood is present in HCO3 form in plasma and RBCs.

25- Peripheral and central chemoreceptors may both contribute to the increased ventilation that occurs as a result of

a- A decrease in arterial oxygen content

b- A decrease in arterial blood pressure

c- An increase in arterial PaCO2

d- An increase in arterial pH

Answer: c, increase in the PaCO2 is the only stimulus of central and peripheral chemoreceptors together

26- the pulmonary blood flow at the lung apices

a- less than at bases

b- more than at their bases

c- the same of their bases

d- not effect by gravity

Answer: a, due to the effect of gravity.

27- 2,3DPG (2,3 diphosphoglycerate) is present in high concentration in RBCs is:

a- combines with hemoglobin to force it to release O2

b- help RBCs to binding with O2

c- maintain the O2 inside RBCs

d- no thing from above

Answer: a

28- The surface tension of the alveolar fluid:

a- increases the lung compliance.

b- decreases the lung compliance.

c- a&b

d- no effect in lung compliance .

Answer: b

29- Decrease in blood PH leads to :

a- stimulation of the respiratory center by stimulating the peripheral chemoreceptor

b- stimulation of the respiratory center by stimulating the central chemoreceptor

c- inhibition of respiratory center by inhibiting the peripheral chemoreceptor

d- inhibition of respiratory center by inhibiting the central chemoreceptor

Answer: a, peripheral chemoreceptors are sensitive to the increase in H ions in the blood.

30- Being in high altitudes leads to:.

a- rapid breathing

b- slow breathing

c- eupnea

d- normal breathing

Answer: a

31- hering brewer reflexes play important role during:

a- eupnea in adult

b- expiration

c- inspiration

d- sleep & anesthesia

Answer: d

32- Bronchodilitation is the effect of increased activity of:

a- non-adrenergic non-cholinergic effect.

b- parasympathetic nerve system.

c- enteric nerve system.

d- sympathetic nerve system.

Answer: d

33- Involuntary breathing is caused by the:

a- Hypothalamus
b- cerebellum
c- Cerebral cortex
d- Pons and Medulla oblongata

Answer: d, because it contains the Respiratory centers

34- Carbon monoxide is dangerous because:

a- It binds strongly to hemoglobin, making it unavailable to oxygen
b- It binds strongly to plasma, making it unavailable to carbon dioxide
c- It raises the blood's pH level, causing a person to hyperventilate
d- Carbon monoxide is not harmful, we have it in our bodies normally.

Answer: a, the affinity of CO to Hb is higher than that of O2

35- The exchange of gases between the blood within the capillaries and tissue fluid surrounding the body's cells is called?

a- external respiration
b- cell metabolism
c- cellular respiration
d- internal respiration

Answer: d

36- About how many alveoli are there in the lungs?

a- 300 million b- 300 billion
c- 300 trillion c- none of the above

Answer: a

37- Which of these is a protective reflex?

a- Hiccupping
b- Sobbing
c- Sneezing
d- Itching

Answer: c

38- Reduce affinity of hemoglobin to O2

a- is known as the haldan's effect
b- favors uptake of O2 at the lung
c- can be caused by increased plasma (H+)
d- is signified by reduced P50
Answer: c

39- Bronchodilatation is likely produced by:

a- cholinergic muscarinic agonists
b- ß2 adrenergic antagonists
c- ß2 adrenergic agonists
d- leukatriens
Answer: c

40- The peripheral chemoreceptors:

a- are activated only by hypoxia
b- quickly adapt to hypoxia
c- are the major site through which CO2 stimulate ventilation
d- are stimulated both by hypoxic and stagnant hypoxias
Answer: b

41- Surfactant:

a- is produced by type 1 alveolar epithelial cells
b- increases lung compliance
c- is a glycoprotein
d- production starts only after delivery of term babies
Answer: b

42- In quite breathing expiration is:

a- passive and due to elastic lung tissue alone
b- passive and both to surface tension and elastic tissue
c- active due intercostals muscles
d- accompanied by an increase in the recoil force of the lung
Answer: b

43- Cyanosis:

a- is caused by low hemoglobin concentration
b- is caused by high concentration of carboxyhemoglobin
c- may be caused by hypoxic or stagnant hypoxia
d- its occurrence is related to the proportion and not the absolute concentration of reduced hemoglobin
Answer: c, it is caused by the abnormally great increase of reduced Hb, it appears in patients with hypoxic or stagnant hypoxia.

44- The rhythemicity center:
a- is located in the pons
b- is spontaneously active
c- activity causes expiration
d- activity is increased by pneumotaxic center
Answer: a

45- Hypoventiation may lead to:
a- low PCO2 in venous blood
b- high PCO2 in arterial blood
c- low ionized serum calcium
d- shift of the hemoglobin oxygen dissociation to the left
Answer: b, hypoventilation causes hypercapnia and that means CO2 would increase in the circulation.

46- The vital capacity:
a- is higher in the elderly than young adults
b- more than 80% of it expired in the first second of forced expiration
c- is twice as much in females than in males
d- is increased by surfactant deficiency
Answer: b

47- Pulmonary fibrosis would be expected to produce:
a- histotoxic hypoxia
b- stagnant hypoxia
c- decreased vital capacity
d- increased compliance
Answer: c, because fibrosis will decrease the elasticity of the lungs which will decrease the VC.

48- Which of the following has the greatest effect on the capacity of blood to transport O2

a- hemoglobin concentration
b- pH of plasma
c- PCO2 of blood
d- Temperature of the blood
Answer: a

49- The physiological dead space:
a- Is exactly equal to the anatomic dead space in normal people
b- Increases during exercise
c- Is measured by single breath nitrogen analysis
d- Is higher in elderly than young adults
Answer: d

50- A veno-arterial shunt is likely to:
a- Decrease the cardiac output
b- Increase the pulse pressure
c- Increase venous return
d- Decrease PaO2
Answer: d, because there are bronchial veins, which drain their blood directly to the pulmonary veins and some coronary veins drain their blood to the left side of the heart directly.

51- In a patient, hypoventilation is most likely if:
a- PaO2 is low
b- pH of arterial blood is low
c- PaCO2 is high
d- O2 in arterial blood is low

Answer: c, in hypoventilation, the CO2 accumulate in the blood and not excreted well through the lungs.

52- Exchange of which of the following gases across the respiratory membrane is normally diffusion limited*:*
a- Oxygen
b- Carbon dioxide
c- Carbon monoxide
d- Nitrogen
Answer: c, Carbon monoxide cannot move freely across the alveo-capillary membrane.

Blood physiology

1. In haemostasis, which molecule polymerises to become the insoluble blood clot?
A. factor X
B. thrombin
C. fibrin
D. plasmin

Answer is C : Fibrin is a monomer that polymerises to form a “soft clot”, then crosslinking between fibrin produces a stable, web-like “hard clot”.

2. What would a person with type A blood also have?
A. antibody A
B. antigen A
C. agglutinin A
D. agglutinogen B

Answer is B : Type A blood means that the A antigen is on the red blood cells They also have antibody B (= agglutinin B) in their plasma. An agglutinogen is an antigen that stimulates production of agglutinin, hence antigen A is also known as agglutinogen A.

3. The term “formed elements” used in relation to the blood include which of the following?
A. fibrinogen.
B. white blood cells.
C. electrolytes.
D. plasma proteins.

Answer is B: White blood cells are one of the formed elements (that is, substances that are not dissolved in plasma)

.4 Which are the two most common types of white blood cells?
A. neutrophils and lymphocytes
B. erythrocytes and neutrophils
C. neutrophils and eosinophils
D. monocytes and lymphocytes

Answer is A: 50–70 % of wbc are neutrophils and another 25 % are lymphocytes.

5. The colloid osmotic pressure of blood is due to which of the following?
A. proteins in the blood
B. proteins in the interstitial fluid
C. sodium and chloride ions dissolved in blood
D. the water component of the blood
Answer is A: Plasma proteins (also called "colloids") produce colloid osmotic pressure. There should be no proteins in the interstitial fluid.

6. Which of the following statements about platelets is INCORRECT:
A. adhere to collagen fibres of damaged tissue
B. release phospholipids which combine with "clotting factors" to produce prothrombin activator.
C. are cell fragments derived from megakayoblasts
D. are part of the "extrinsic pathway" for the formation of prothrombin activator.
Answer is B : Platelets do not release phospholipids.

7. With which blood types can a person with blood type B be safely transfused?
A. A or AB
B. B or O
C. A or O
D. B or AB
Answer is B : A person with blood type B has anti-A agglutinins in their plasma so cannot receive cells with the A antigen on the RBC. Hence the blood types in choices A, C & D are not suitable.

8. If someone's ABO blood group is "type A", this means that
A. they have the type A antigen on their red blood cells
B. their blood contains anti-A agglutinins
C. they can receive blood from a type B donor
D. they may donate blood to a type B recipient
Answer is A: Type A means having the A antigen on the rbc (and having anti-B agglutinins in the plasma).

9. What substance is the product of the second step in the blood clotting process?
A. thrombin B. prothrombin
C. prothrombin activator D. fibrin

Answer is A : The second step is the formation of thrombin from prothrombin (first step is formation of prothrombinase (=prothrombin activator).

10. What does "Rhesus positive" refer to?
A. The presence of antigen D on the surface of red blood cells
B. The final factor involved in blood clotting
C. The presence of the rhesus antibody/agglutinin in the blood
D. A deficiency of Factor VIII that results in haemophilia

Answer is A: Rh factor, Rh positive and Rh negative refer to the D antigen only If the antigen is present on your rbc, you are called Rh-positive (you have the Rh factor).

11. What is found in blood serum that is also in blood plasma?
A. blood cells
B. platelets
C. plasma proteins
D. clotting factors

Answer is : C Plasma proteins (except fibrinogen) are in plasma and in serum. Serum = plasma minus the clotting factors. Blood cells and platelets are not in plasma.

12. Which blood cells are involved in protecting the body from pathogens and foreign cells?
A. erythrocytes
B. leucocytes
C. platelets
D. haemoglobin

Answer is B : Leucocytes (white blood cells) include NK (natural killer), T & B lymphocytes & macrophages & microphages

13. In the process of haemostasis, which phase involves the intrinsic and extrinsic pathways?
A. the platelet phase
B. the clot lysis phase
C. the vascular phase
D. the coagulation phase

Answer is D: The clotting (coagulation phase) has these two pathways.

14 .Monocytes

A. Originate from precursor cells in lymph nodes.
B. Can increase in number when their parent cells are stimulated by factors released from
activated lymphocytes.
C. Unlike granulocytes, do not migrate across capillary walls.
D. Manufacture immunoglobulin M.

Answer is B :Activated T cells release GMCSF (granulocyte/macrophage colony stimulating
factor) which stimulates monocyte stem cells to proliferate.

15. About Neutrophil granulocytes which one is true?

A. Are the most common leukocyte in normal blood.
B. Contain proteolytic enzymes.
C. Have a lifespan in the circulation of 3–4 weeks.
D. Contain actin and myosin microfilaments.

Answer is C : their life span is less than a day.

16. Normal blood clotting requires

A. Inactivation of heparin.
B. Inactivation of plasmin (fibrinolysin).
C. An adequate intake of vitamin K.
D. An adequate intake of vitamin C.

Answer is : CVitamin K is needed by the liver for synthesis of prothrombin and other factors.

17 . About The conversion of fibrinogen to fibrin all the following are true except.

A. Is effected by prothrombin.
B. Involves the disruption of certain peptide linkages by a proteolytic enzyme.
C. Is followed by polymerization of fibrin monomers.
D. Is inhibited by heparin.

Answer is A: It is effected by thrombin; prothrombin is the inactive precursor of thrombin.

18. About Blood platelets all the following are true except

A. Are formed in the bone marrow.
B. Are normally more numerous than white cells.
C. Have a small single-lobed nucleus.
D. Increase in number after injury and surgery

Answer is C: Have no nucleus – but the cytoplasm contains electron dense granules, lysosomes and
mitochondria.

19. Breakdown of erythrocytes in the body

A. Occurs when they are 6–8 weeks old.
B. Yields iron, most of which is excreted in the urine.
C. Yields bilirubin which is carried by plasma protein to the liver.
D. Is required for the synthesis of bile salts.

Answer is : C The protein makes the bilirubin relatively water-soluble.

20. About Red cell formation is increased by all the following except

A. By giving vitamin B12 injections to healthy people on a normal diet.
B. In blood donors one week after a blood donation.
C. In patients with haemolytic anaemia.
D. By giving injections of erythropoietin to nephrectomized patients

Answer is A: Healthy normal people do not benefit from vitamin B12 supplements.

21. Which is the LEAST common type of white blood cell?

A. lymphocyte
B. basophil
C. thrombocyte
D. neutrophil

Answer is B : Less than 1 % of wbc are basophils. Neutrophils are the most common. Thrombocytes are not wbc, or even cells.

22. The relative viscosity of the blood :-

A. 4 - 5 times . B. 6 - 7 times.

C. 8-9 times. D. 9 - 15 times.

Answer is A : the viscosity of the blood is 4 - 5 times as water.

23. Dicumarol antidote against overdoage as :-

A. Prostamine So4, 1%

B. Vitamin K.

C. Both a&b .

D. Neither a nor b.

Answer is B :- the antidote of Dicumarol is the administration of large doses of vitamin K.

24. In thrombocytopenic purpura which test is normal :-

A. Clotting time. B. Bleeding time.

C. Vasocostriction. D. Platelet plugging.

Answer is A : because the clotting process doesn't require large number of platelets .

25. Pernicious anemia due to deficiency of :-

A. Vitamin K. B. Iron.

C. Vitamin B12. D. Non of the above.

Answer is C :- deficiency of vitamin B12 lead to pernicious anemia.

26. The first phase of hemostasis os :-

A. Separation of globin & heme.

B. Platelets agregation .

C. Acivation of prothrombin.

D. Vascular spasm

Answer is D :- The first phase of hemostasis is vasoconstriction(V.C)of the injured vessel.

27. These cells are important phagocytes & eventually become macrophages.

A. Neutrophils. B. Basophils.

C. Monocytes. D. Lymphocytes.

Answer is C :- monocytes in the blood enter the tissue and become the tissue macrophages.

28. Excessive destruction of erythrocytes can result in :-

A. Thalassemia. B. Hemolytic anemia.

C. Aplastic anemia. D. Macrocytic anemia .

Answer is B :- Excessive hemolysis (break down)of the R.B.C.s. lead to hemolytic anemia.

29. The reticuloendothelial system performs all the following function except :-

A. Defense function.

B. Formationof blood cells.

C. Repair of injured tissues.

D. Synthesis of haemoglobin .

Answer is D : haemoglobin contain 2 parts :-

1- heme formed mainly by the liver & bone marrow

2- globin synthesized only in the liver. Haemoglobin is synthesized in erythroblast.

30. About the total body water, all the following is true except :-

A. It constitutes 1/2 - 2/3 of the body weight (about 60%).

B. It is measured by the indicator dilution technique using deuterium oxide.

C. Together with solutes . it forms the body fluids .

D. It is formed mainly of the interstitial fluid.

Answer is D : it formed mainly of ICF about 2/3 of it.

31. The phase of coagulation that begins with exposed endothelial collagen is :-

A. Extrinsic pathway. B. Intrinsic pathway.

C. Common pathway. D. Fibrin stabilization.

Answer is B : intrinsic pathway occur in vivo ex. in cases of intravascular clotting (thrombsis) which occur when blood is exposed to damage endothelial cells or dub endothelial collagen fibres.

32. A hematocrit value of 80 is termed :-

A. Polycythemia. B. Anemia.

C. Thrombocytopenia. D. Leukemia.

Answer is A : normal hematocrit value is arround 45% in adults & 60 % in newly born infants higher than that called polycythemia , and lower than that called anemia.

33. All the clotting factors are protein made by the liver except :-

A. Factor lll. B. Factor IV.

C. Both a & b. D. Neither a nor b .

Answer is C :- all clotting factors are globulins that are synthesized by the liver except factor lll , factor IV , Von Willebrand factor, factor XIII.

34. Lake of factor VIII cause :-

A. Hemophilia A. B. Hemophilia B.

C. Para hemophilia. D. Both a& b .

Answer is A :- congenital deficiency of Factor VIII lead to Hemophilia A (classic Hemophilia).

35. The decrease in the number of platelets cause :-

A. Thrombocytopenic purpura.

B. Thromboasthenic purpura .

C. Both of them.

D. Neither a nor b.

Answer is A :- sever reduction of the platelets count (below 4000 - 50000/mm3) lead to thrombocytopenic purpura.

36. The old RBSs are destroyed by the :-

A. Kidney. B. Spleen.

C. Liver. D. Non of the above.

Answer is B :- all old and abnormal red blood cells are removed by the macrophages in the spleen.

37. Before blood transfusion, which of the following should be done:-

A. Erythrocytes sedimentation rate. B. Blood indicis .

C. Osmotic fragility of RBCs. D. Cross matching test .

Answer is D :- because t is the best safeguard against the complications of blood transfusion.

38.The albumin / globulin ratio (A/G) is increase in:-

A. advanced liver diseases. B. Nephritis .

C. Hypogammaglobulinemia. D. Sever infection .

Answer is C :- due to decreasing in the globulin fraction.

39. The following are indication of blood transfusion except :-

A. Hypotension. B. Hypoproteinemia.

C. Leukemia. D. Leukopnia.

Answer is A :- because hypotension isn't exact marker for blood transfusion.

40. About humoral immunity :-

A. It produced by the T-lymphocytes .

B. It produced by the B - lymphocytes.

C. Is a major defense against viral infection.

D. Can't be activated by direct contact with antigen.

Answer is B :- humoral immunity produced by the B-lymphocytes.

41. Which of the following substances isn't required for normal RBCs production :-

A. Vitamin D B. Folate.

C. Iron. D. vitamin B12.

Answer is A :- Vitamin D isn't important for formation of normal RBCs.

42. Erythropoietin :-

A. Is produced mainly by the heart

B. Inhibit the production of RBCs

C. Its production increases when blood O2 decreases.

D. Its production inhibited by testosterone

Answer is C :- because hypoxia is the most powerful stimulus for erythropiesis through increasing secretion of erythropoietin hormone.

43. A person with type A blood group :-

A. has anti - A antibodies
B. Has type B antigens
C. Will have transfusion reaction if given type B group
D. All of the above

Answer is C :- because he has type A antigens &
Anti-B antibodies.

44. Hb is decreased in :-

A. Exercise. B. Hot weather.
C. Emotions. D. Non - of the above
Answer is D :- Hb increases due to blood ejection from the spleen .

45. Blood clotting factor III is :-

A. Tissue thromboplastin
B. Prothrombin
C. Christmas factor
D. Stuart - power factor

Answer is A :- factor III called tissue thromboplastin.

46.The plasma constitute of blood volume about :-

A. 55% B.45% C. 65% D. 50%
Answer is A : The plasma constitute about 55 - 60 % of the total blood volume.

47. The plasma protein include :-

A. Calcium
B. Albumin
C. Kallikrein
D. Seotonin
Answer is B :The plasma protein include mainly albumin , globulin, fibrinogen.

48. Number l factor of blood clotting names :-

A. Prothrombin
B. Calcium
C.Thromboplastin
D. Fibrinogen

Answer is D : blood clotting factor number l called fibrinogen.

49. The normal clotting time is :-
A. 6 -10 min. B. 6 - 10 second.
C. 1 - 2 min. D. 1 - 2 second.

Answers is A : normal clotting time is 3 - 8 up to 10 minutes.

50. The function of plasma protein include :-
A. Hemostasis
B. Buffering system
C. Hormonal activity
D. All of the above
Answer is D : All of the above are functions of plasma proteins.
51.Blood platelets assist in arresting bleeding by all of the following except :-
A. Releasing factors promoting blood clotting.
B. Adhering together to form plugs when exposed to collagen.
C. Liberating high concentrations of calcium.
D. Releasing factors causing vasoconstriction
Answer is C : High Ca2 levels are not needed for haemostasis; normal levels are adequate.

52.Blood group antigens (agglutinogens) are:-
A. Carried on the haemoglobin molecule.
B. Beta globulins.
C. All of the above.
D. Non of the above .
Answer is D :They are glycoproteins present on the membrane of red blood cell.

53.Blood :-
A. Makes up about 8 per cent of body weight.
B. Forms a higher percentage of body weight in fat than in thin people.

C. Volume can be calculated by multiplying plasma volume by the haematocrit (expressed as a percentage).
D . none of the above.

Answer is A : blood volume normally about 8 % of the body weight, 80 ml /kg of body weight.

54. Intravenous infusion of
A. Two litres of normal saline restores blood volume in a patient who suddenly lost two litres of blood.
B. Isotonic glucose will expand both intracellular and extracellular fluid compartments.
C. Potassium-free fluids are appropriate for a patient with severe vomiting.
D. All of the above.

Answer is B :Glucose is metabolized, leaving the water to be distributed in both compartments.

55. Haemolytic disease of the newborn
A. Affects mainly babies of Rh-positive mothers.
B. Occurs mainly in babies who lack D agglutinogen.
C. Causes jaundice which clears rapidly after birth.
D.Can be prevented by injecting the mother with anti-D agglutinins just after delivery.

Answer is D : These destroy fetal Rh-positive cells in the maternal circulation before such cells
can sensitize her to D antigen.

56.Iron deficiency
A. Frequently follows persistent loss of blood from the body.
B. Is more common in men than in women.
C. May cause anaemia by inhibiting the rate of multiplication of RBC stem cells.
D. May cause large pale erythrocytes to appear in peripheral blood.
Answer is A : Especially if dietary intake of iron is limited.

57. Severe reactions are likely after transfusion of blood group :-
A. A to a group B person. B. O to a group AB person.
C. A to a group O person. D. A & C.

Answer is D : The recipients have anti-A antibody.

58.Blood eosinophils
A. Have agranular cytoplasm.
B. Are about a quarter of all leukocytes.
C. Are relatively abundant in the mucosa of the respiratory, urinary and alimentary tracts.
D. B & C

Answer is C : They are involved in mucosal immunity.

59. The average half-life of neutrophils in the circulation is:
A. 6 hours. B. 5 days. C. 2 weeks. D. 1 month

Answer is A : the life span of granulocytes in the circulation is 4 - 8 hours.

60.Which of the following is incorrect about fetal hemoglobin (Hb F) :-
A. In comparison to HbA, Hb F has greater affinity for 2,3–BPG
B. The oxygen dissociation curve of HbF is shifted to the left relative to HbA.
C. At low PO2, Hb F gives up more oxygen to tissues than Hb A
D . non of the above.

Answer is A : Hb F binds 2,3 BPG less avidly compared to Hb A and therefore has a greater affinity for oxygen relative to Hb A. This is one reason why it is able to draw O2 from Hb A.

61. The normal osmotic pressure of the plasma is similar to :-
A. 0.9 %glucose solution. B. 0.9 %NaHCO3 solution.
C. 40 mmHg. D. 0.9 % NaCl solution.

Answer is D : A 0.9 % NaCl solution and a 5 % glucose solution are both isotonic.

62. The viscosity produced by the plasma proteins is mainly due :-
A. Prothrombin. B. Albumin.
C. Fibrinogen. D. All of the above.

Answer is C : the main function of Fibrinogen is blood coagulation and blood viscosity (due to its large molecular weight).

63. The activation of prothrombin into thrombin is achieved by :-

A. Factor Xa. B. Factor lll. C. Factor VIII. D. Factor lXa

Answer is A : Active factor X (Xa)Acts as a prothrombin activator that converts prothrombin to thrombine.

64. About the action of anticoagulants, all the following are true except :-

A. Dicumarol interferes with the synthesis of prothrombin in the liver .
B. Oxalates form insoluble salts with Ca++.
C. Citrate and other chelating agents bind Ca++.
D. Heparin blocks the action of antithrombin III.

Answer is D : Heparin mainly facilitating the action of antithrombin III.

65. Incompatible blood transfusion may cause all the following except :-

A. Haemolytic jaundice. B. Anuria .
C. Capillary block. D. Hypertension .

Answer is D : It leads to Hypotension (and may be shock) as a result of the generalized V.D

67. Erythropoiesis in adult individuals occurs normally in the :-

A. Liver. B. Red bone marrow.
C. Yellow bone marrow. D. Spleen .

Answer is B : Red bone marrow is the normal site of erythropoiesis in adult.

68. If man's plasma agglutinates both A & B red cells , he is group :-

A. B. B. A.
C. O. D. AB

Answer is C : Group O is a universal donor and receives blood only from group O (has A, B anti bodies)

69. The most important function of neutrophils & monocytes is :-

A. Phagocytosis. B. Blood coagulation.

C. Antibody production. D. Chemotaxis .

Answer is A : the main function of neutrophils & monocytes is phagocytosis and destruction of the invading bacteria.

70. The intrinsic factor is :-

A. found in the liver.

B. Produced by the gastric parietal cells.

C. Is secreted by the terminal ileum.

D. Aids absorption of folic acid.

Answer is B : intrinsic factor produced by the gastric parietal cells with HCL , its function help in absorption of vitamin B12 .

71. The tendency for a transplanted organ to be rejected is reduced by :-

A. Irradiation of the organ with X-ray.

B. Stimulting erythropoiesis .

C. Drugs that increase mitosis.

D. Drugs that decrease the lymphocytic count .

Answer is D : decrease in lymphatic count lead to decrease the immunity which help in transplantation of the organs .

72. All the following about erythroblasosis fetalis is true except :-

A. It is common with Rh +ve fathers & Rh -ve mothers .

B. Jaundice of the newborn is the major manifestation.

C. It treated by blood transfusion having a Rh characteristic as that of the mother.

D. It can't affect the first baby of Rh -ve mothers.

Answer is D : is aserious disease that can affect Rh +ve fetuses if the mother was Rh -ve & sensitized by the Rh antigen.

73. Concerning the granulocytes :-

A. The most abundant type is eosinophils.

B. The eosinophils count increases in ascaris infections.

C. The neutrophils Phagocytize bacteria by a passive process.
D. The basophils are actively phagocytic.

Answer is B : parasitic infection lead to increase the number of eosinophils. Ex. Ascaris & bilharzia.

74. Thrombin is required for acivation of all the following except :-

A. Plasminogen. B. Fibrinogen.
C. Factor lll. D. Factor VIII.

Answer is C : factor lll or thromboplastin (TPL) released from the damaged tissue as active factor.

75. The extracellular fluid (ECF) differs from the intracellular fluid (ICF) in that :-

A. It forms the major proportion of the total body water .
B. It has a higher sodium : potassium molar ratio .
C. It has lower tonicity .
D. Its principal anions are organic.

Answer is B : The ECF has high amount of sodium and less potassium while ICF has high amount of potassium and less sodium .

76. The total body water :-

A. Is equally distributed inside and outside the body cells .
B. Is not important for regulation of body temperature.
C. Forms a smaller percentage of the body weight in fat persons.
D. It formed mainly of the interstitial fluid.

Answer is C: because the body fat is relatively free of water.

Gastro-intestinal tract

1- Where are most fat digestion enzymes produced?

A) Small intestine b) gall bladder c) liver d) pancreas

Answer: D, the most potent enzyme for digestion of fat acid is (pancreatic lipase)

2- Gastric emptying is purposes after consuming of:-

a) High portent diet b) High fat diet

c) Alcohol d) carbohydrate

Answer: C, Gastric emptying accelerate after alcohol drinking its one from chemical factor that increase gastric motility.

3- No regulate pancreatic section secretion:-

a) Secretin b) acetyl choline c) histamine d) CCK

Answer: C, secretin stimulate secretion the watery pant pancreatic juice

Acetylcholine stimulate the secretion of pancreatic juice specially the enzymatic part through vagus activity also CCK stimulation the enzymatic part.

4- Distension of stomach:

a) Is associated with decrease in peristaltic activity in stomach

b) Decrease tone of lower esophageal sphincter

c) Causes acute increase in pressure inside the resting stomach.

d) Results in potentially large increase in volume with very little pressure change.

Answer: D

5- Intestinal secretion is:

a) Regulated mainly by local myentric reflex and enteric reflex

b) Regulated mainly by vagal activity

c) Abolished by vagoactomy

d) Decrease by glycogens

Answer: B, Myentric reflex control motility no secretion – vagal activity one from regulated mechanism of intestinal secretion additions to local reflex and some hormone as secretin- glucagon decrease motility no secretion- vagoactomy decrease just but not abolished (stopped) because present other mechanism .

6- Digestion in the GIT:

a) Occurs only in the small intestine.

b) Is accelerated by peristaltic waves in small intestine.

c) Begins by digestion of protein in the buccal cavity .

d) Occurs only by the action of enzymes in the pancreatic juice.
e) IS mainly a chemical process.
Answer: E , Because the digestion process enzyme that breakdown and hydrolysis the large molecules in small molecules.

7- Mastication:
a) IS entirely a voluntary act.
b) Includes both voluntary and reflex components.
c) IS performed by muscles that are supplied by the 7th (facial) cranial nerve.
d) IS normally initiated by conditioned reflexes.
e) IS important for digestion of carbohydrates only.
Answer: B موجود في كتاب مجدي صبري صـ7

8- Normal swallowing depends on the integrity of the:-
a) 9th and 10th cranial nerves.
b) Appetite enter in the hypothalamus
c) Trigeminal nerve.
d) Spinal cord.
Answer: A لتأكد موجود في كتاب مجدي صبري صـ13

9- The GH controlled by:
a) Its own intrinsic nervous system (Auerbachs and Meissners plexuses).
b) The sympathetic N.S
c) The parasympathetic nervous system.
d) Only B and C
e) A, B and C
Answer: E موجود في كتاب مجدي صبري صـ5
Intrinsic nervous system
Stimulation by parasympathetic and inhibition by sympathetic.

10- Gastric emptying:
a) IS normally completed about 9 hours after ingestion of a usual meal.
b) IS slowest if the food is soft and rich in carbohydrates.
c) IS inhibited by excessive acidly in the duodenum.
d) IS delayed by presence of fat or hypertonic solutions in the duodenum.
e) IS delayed by distension of the stomach and by vagal stimulation.

Answer: C, when acidity in duodenum mucosa or distension of duodenum by gastric content stimuli gastric inhibitor H as cck and initiate enter gastric reflex.

11- About the CRP, all the following is true except:

a) It inhibits the intestinal motility (through liberating gastrin).
b) It increases the gastric section (through liberating gastrin).
c) It increases the pancreatic secretion (through liberating gastrin).
d) It is found in the hypothalamus (in addition to the G I T).
e) It is the neurotransmitter of the regal nerve endings that terminate on the E cells. موجود في مجدي صبري صـ66

Answer: A

12- The gastric juice has all the following characteristics except:

a) It contains an alkaline secretion from the surface epithelium.
b) Its Ph is always less than 3.
c) It contains the intrinsic factor, which is essential for vitamin B12 absorption.
d) Its antibacterial action is produced by its mucus content.
e) Its volume averages 2.5 litres lday.

Answer: D, Anti-bacterial action is produced by HCL but mucus and for neutralize the acidity in stomach.

13- Stomach emptying is delayed all the following except:

a) Certain GIT hormones e.g. secretin. CCK and GIP.
b) Presence of excess fat in meal.
c) Distension of the duodenum1.
d) Moderate gastric distension.
e) The enterogastric reflex and bilateral vagotomy.

Answer: C. موجود في كتاب مجدي صبري صـ 28

14- About the GIP .all the following is true except:

a) It is secreted from the duodenal mucosa.
b) It has a +ve feedback effect on gastric secretion and motility.
c) Its release is stimulated by presence of excess fat.
d) It inhibits both gastric secretion and motility.
e) It stimulates insulin secretion.

GIP inhibition the gastric secretion.

Answer: B موجود في كتاب مجدي صبري صـ 64

15- The rate of gastric emptying is:

a) Proportionate within limits to the volume introduced into the stomach.
b) Not affected by the resistance to flow offered by the pylorus.
c) Primarily controlled by the glucose concentration in the saliva.
d) Increased by presence of fat in the duodenum and decreased by gastrin .
e) Not influenced by the acidity or osmolality in the first of the duodenum.

Answer: A

16- At rest the esophagus is:

a) Often from above.
b) Open from down.
c) Close from above and down.
d) Open from above and down.

Answer: C

17- Absorption of fat:

a) Portal vein then to liver.
b) Portal vein then hepatic vein.
c) Cylomicrones then to lymph
d) Directly to liver through hepatic vein

Answer: C

18- Function of the liver include all the following except:

a) Storage of blood.
b) Storage of B12, A, B, E.2E
c) Cytolysis of RBCs.
d) Purification and maintenance of plasma.
e) None of the above

Answer: D

19- Inhibition of gastric motility by all the following except:

a) CCK
b) 3ecretin
c) Histamine
d) Type of food.

Answer: C

20- Regarding to stomach empting is delay:
a) Digestion of carbohydrate.
b) Digestion of protein.
c) Digestion of fat.
d) Digestion of acidity in the duodenum.
Answer: C

21- Regarding to digestion:
a) Carbohydrate start in mouth protein and fat in the stomach.
b) Carbohydrate and fat start in the mouth and protein in stomach.
c) Protein in mouth fat and carbohydrate in stomach.
d) Composition of have no effect in digestion in the bowel.
Answer: B

22- Secretion of HCL in the stomach is dialed by:
a) Vegal inhibition
b) Histamine
c) Omething
d) Increase acidity in duodenum
Answer: B

23- After complete hepatectomy, a rise would be expected in the blood level of:
a) Glucose
b) Fibrinogen
c) 25- hydroxycholecalciferol.
d) Conjugated bilirubin
e) Estrogens
Answer: E

24- Which of the following would not be produced by total pancreatectomy:
a) Vitamin E deficiency.
b) Hyperglycemia.
c) Metabolic acidosis.
d) Weight gain.
e) Decreased absorption amino acids.
Answer: D

25- Calcium absorption is increased by:

a) Hypercalcemia.
b) Oxalates in the diet.
c) Iron over toad
d) 2.25- dihydroxycholecalciferol
e) Increased Na+ absorption .
Answer: D

26- Bile:

a) Contains bilirubin mainly in the unconjugated form.
b) 3alts contribute to the 30lubility of cholesterol in bile.
c) Pigments are important in the digestion of fat
d) Can achieve a higher bicarbonate level than can pancreatic juice.
e) Becomes more alkaline during concentration in the gall bladder .
Answer: B

27- Secretion of 3alia increases with all except:

a) When touch receptors in the mouth are stimulated.
b) Markedly when fluid with a ph 4-5 is ingested.
c) More when sweet than when sour food is inge3ted.
d) Just before vomiting.
e) In respon3e to parasympathetic.
Answer: C

28- In the lumen of the normal stomach all true except:

a) Ph does not fall below 2.
b) Pepsinogen is converted to pepsin by hydrochloric acid.
c) Acid secretion (millimoles per hour) is maximal after pentagastrin.
d) Bacterial count rises markedly after histamine H2 blockade.
e) Ph yi3es after blockage of a gastric H+ pump.
Answer: D

29- Intestinal secretions contain:

a) Enzymes, which are released mainly in response to vagal activity.
b) A potassium concentration similar to that of extracellular fluid.
c) Intrinsic factor.
d) Enzymes which hydrolyse monosaccharides .
e) A substance, which activates trypsinogen.

Answer: E

30- Saliva functions include all the following except:

a) Contains a starch digesting enzyme.
b) Can break starch down to monosaccharides.
c) Is necessary for normal swallowing .
d) Is necessary for normal speech.
e) Has an important antiseptic action.
Answer: B

31- Bile salts –all are true except:

a) Are the only constituents of bile necessary for digestion.
b) Have a characteristic molecule, part water, part fat- soluble.
c) Are reabsorbed mainly in the appear small intestine.
d) Are derived from cholesterol.
e) Are produced in part by bacterial action.
Answer: C

32- The risk of developing gallstones increases:

a) When cholesterol micelles are formed in the gall bladder
b) As the bile salt cholesterol ratio increases.
c) As the lecithin cholesterol ratio increases.
d) When supplementary bile salts are taken by mouth.
e) In patients with haemolytic anaemia.
Answer: E

33- Loss of liver function causes an increase in all of the following except:

a) Albumin to globulin ratio in blood.
b) Breast size in the male.
c) Level of unconjugated bilirubin in the blood.
d) Bleeding tendency.
e) Tendency for the blood glucose level to vary.
Answer: A

34- The major mechanism for absorption of sodium from the small intestine is :

a) None electrolytic cotransport.
b) Cotransport with potassium.

c) Electrogenic transport.
d) Neutral NaCL ABSORPTION
e) Solvent drag.
Answer: D

35- All of the following statements about bile acids are correct EXCEPT:
A) Bile acids are secreted as conjugated bile salts by the liver.
B) Bile acids are dehydroxylated by intestinal bacteria.
C) Bile acids are absorbed in the intestinal and return to the livervia the portal vein.
D) Bile acids facilitate absorption of fat by emukifying glycerides.
E) Sulfation of bile acids promotes their up take in the intestine.
Answer: E

36- Dietary fat is absorbed chiefly in the:
a) Stomach
b) Jejunum
c) Ileum
d) Caecum
e) Ascending
Answer: B

37- Gallbladder contraction is controlled primarily by the hormone:
a) Enterogastrone
b) CCK
c) Insulin
d) Secretin
e) Glucagon
Answer: B

38- All of the following statements about somatostatin are true EXCEPT:
a) It inhibits gastrin section.
b) It is secreted by the hypothalamus.
c) It is secreted by pancreatic islet cells.
d) It is released following vagal blockade.
e) Its effects are prolonged.
Answer: E

39- The rate of gastric emptying is influenced by all of the following factors except:
a) Carbohydrate in gastric contents.
b) Secretion of gastrin by antral G cells.
c) Distension of the duodenum.
d) Osmolality of duodenal contents.
e) Acidity of chime entering the duodenum.
Answer: A

40- Vitamins synthesized by intestinal bacterial and absorbed in significant quanties :
a) Vitamin B6 .
b) Vitamin K
c) Thiamin e
d) Ribo flavin
Answer: A

41- Absorption of fat-soluble vitamin requires:
a) Intrinsic factors
b) Chymotrypsin
c) Pancreatic lipase
d) Pancreatic amylase
Answer: C

42- Acidification of duodenum will:
a) Decrease pancreatic secretion of bicarbonate.
b) Increase secretion of gastric acid.
c) Decrease gastric empting
d) Increase contraction of sphincter of odd.
Answer: C

43- All following increase gastrin secretion except:
a) Calcium
b) Increase vagal tone
c) Secretin
d) Luminal peptide and amino acid.
Answer: C

44- Saliva has all following constituents except:

a) Bicarbonate
b) Phosphate
c) Glucose
d) Lysozyme

Answer: C

45- The stimulation of release of pancreatic secretion normally involve all of following except:

a) Ach
b) CCK
c) Histamine
d) Neural stimulation

Answer: C

46- Which one following statement about the colon correct:

a) Absorption of na in the colon is under (aldosterone) control.
b) Bile acids enhance absorption of water from colon.
c) Net absorption of Hco3 occurs in colon.
d) Net absorption of k occurs in colon.

Answer: A

47- Gastro colic reflex:

a) Local enteric reflexes.
b) Ganglionic reflexes
c) Central nervous reflexes
d) None of them.

48- Swallowing center present in:

a) Medulla oblongata.
b) Pons
c) Medulla oblongata and lower pons.
d) Cerebral cortex.

Answer: C

49- The action of large doses of gastrin hormone is:

a) Increase the tone of lesser esophageal sphincter
b) Decrease the tone of lesser esophageal sphincter.
c) Relaxes the lesser esophageal sphincter.
d) Contraction of pylori sphincter.

Answer: A

50- One of these not stimulate gastric secretin:

a) Anxiety gastric motility.
b) Fear motility
c) Anger gastric motility
d) Vagus stimulation

Answer: B

Renal System

1- Reabsorption of sodium in PCT :

A-Increases by alkalosis and decreases by acidosis

B-Increases by increase NaCl in RPF

C-Increases by increase aldosterone

D-Increases by increase GFR

AN: (D) because increase GFR > increase plasma oncotic pressure in peritubular capillaries > increase Na reabsorption

2- All the following conditions leads to metabolic acidosis except :

A-Excessive vomiting

B-Uncontrolled DM

C-Renal failure

D-Addison's disease

AN: (A) because excessive vomiting > expulsion of H > metabolic alkalosis. Metabolic acidosis occurs in prolonged vomiting .

3- About secondary active transport , all the following is true except :

A-Carrier protein is needed

B-May be symprt or antiport

C-Energy derived directly from ATP hydrolysis

D-Glucose is an example of it

AN: (C) indirectly (requires active transport)

4- H ion in urine :

A-Increases by inhibition of carbonic anhydrase

B-Increases by inhibition of aldosterone secretion

C-Increases by increase K in renal tubular cells

D-Increase by rise Co2 in renal tubular cells

AN: (D) increase Co2 > increase H_2CO_3 > H + HCO_3 > H secretion

5- About plasma clearance , all except : A- Used for measurement of GFR

B- Used for measurement RBF directly

C- Determines mode of handling of various substances in nephron

D- Does not affect renal function by substance using it

AN: (B) we needs plasma clearance in addition to hematocrit value to determine RBF.

6- When patient treated with aldosterone antagonist , there will be fall in :

A- Urine volume
B- Blood volume
C- Blood viscosity
D- Plasma potassium concentration
AN: (B) due to osmotic diuresis of Na which is not reabsorbed in DCT ,CCD

7- Tonicity of the urine as it enters CD :

A- Hypertonic
B- Hypotonic
C- Isotonic
AN: (B) initial part of DCT is almost impermeable to water late part of DCT is poorly permeable to water .

8- Regarding the secretion of renin , all except : A- Lead to increase aldosterone in blood

B- Lead to increase angiotensin II in blood
C- Lead to fluid retention and decrease GFR
D- Released by cells of JGA
AN: (C) renin > increase angiotensin II > VC of efferent arterioles > increase GFR (by auto regulation)

9- Renin secretin is increased by :

A- Rise of ABP
B- Increase angiotensin II level in blood
C- Increase GFR
D- Sympathetic stimulation
AN: (D) by the action of catecholamine in B1 adrenergic receptors .

10- Effects of ADH in renal tubules:

A- Increase water retention
B- Increase Na reabsorption
C- Increase permeability of renal tubules
AN: (C) action in renal tubules not the net result

11- 65% of K is reabsorbed in PCT while the remaining 30% is reabsorbed in :

A- DCT

B- Thin LH

C- Thick LH

AN: (C) by special carrier that transport one Na,one K and two Cl

12- Increase in intracapsular pressure leads to :

A- Increase filtration and reabsorption

B- Increase filtration and section

C- Decrease filtration

D- No effect

AN: (C) intracapsular pressure is from the opposing forces of filtration (normally 18).

13- Production of ammonia and excretion of NH4 in kidney is due to :

A- Increase protein intake

B- Increase aldosterone secretion

C- Kidney disease

D- Decrease blood PH

AN: (D) because it leads to increase H secretin in renal tubules which is buffered by ammonia to prevent stoppage of H secretion which would cause acidemia .

14- Metabolic acidosis is due to the following except :

A- Diarrhea

B-DM

C-Decrease HCO3 concentration in blood

AN: (A) it occurs in severe diarrhea

15-Hyponatremia is a result of all except :

A-Vomiting

B-Metabolic acidosis

C-Metabolic alkalosis

D-Decrease activity of aldosterone

AN: (B) metabolic acidosis >increases H secretion > increases NaHCO3 reabsorption

16-Indication of glomerulonephritis :

A-Hematuria

B-Proteinuria

C-A and B

D-Non of above

AN: (C) in glomerulonephritis antigen-antibody complex deposits in renal glomerulus and immediately mesangial cells proliferate > entrapping of WBCs > blockage of glomerulus > excessive increase in the permeability of other glomeruli > leads to leakage of blood and protein to GF . Guyton Page 431

17-Death is imminent when PH falls below :

A-7.2

B-7

C-6.8

AN: (C) guyton page 410

18- 95% of filtered K is reabsorbed in :

A-PCT

B-LH

C-DCT

D-Non of above

AN: (D) K absorption : 65% in PCT ,30% in LH

19- Macula densa cell:

A- Secrete renin

B- Secrete erythropoietin

C- Its function is unknown

D- Stimulate secretion of renin

AN: (D) decrease GFR > decrease flow of Na & K through macula densa which act as chemoreceptor to detect solute concentration > stimulate JG cells to secrete renin.

20- Synthesis and secretion of ammonia occurs in :

A- PCT

B- DCT
C- LH
D- A&B
AN: (D) DCT in normal metabolism while PCT in acidosis.

21- The peritubular capillaries :

A- Receive greater blood than glomerular capillary
B- Run through Bowman's capsule
C- Exhibit fluid filtration
D- Form a low pressure system
E- Don't lead to vasa recta in the JM nephron
AN: (D) because its hydrostatic pressure is 13 mmHg

22- Plasma PAH is 0.0175 mg/ml ,urine volume is 2ml/min and urinary PAH is 4 mg/ml plasma clearance is :

A- 457ml/min B- 4570ml/min
C- 45.7ml/min D- 4.57ml/min
AN: (A) C = (2*4) / 0.0175 >>>> C = 457ml/min (equation of plasma clearance)

23- As ABP rises from 100 to 160 :

A- Urinary output remain constant
B- RBF increases proportionately
C- GFR increase slightly
D- VD occurs in afferent arterioles
AN: C, due to auto regulation of GFR

24-Normally , GFR is primarily regulated by :

A- Glomerular blood flow
B- Glomerular capillary pressure
C- Intracapsular pressure
D- Plasma oncotic pressure
AN: B, because it is affected by prostaglandin secreted by the kidney and act locally to regulate RBF & GFR through affecting the diameter of glomerular arterioles.

25-The highest clearance is found in :

A- Na B- Ca C- Mg D- HCO3 E- P(phosphate)

AN: E, it is reabsorbed only in PCT mostly by active transport and its reabsorption is powerfully inhibited by PTH.

26-K excretion is influenced by all of the following except :

A- Aldosterone

B- Rate of secretion of H

C- Amount of Na delivered to tubule

D- Plasma K concentration

E- K concentration in renal tubular cells

AN:D: because it leads to arrhythmia and cardiac arrest before affecting its excretion

27-Secretion of ammonia by the kidney : A- Largely derived from glutamine

B- Helps to eliminate excess base

C- Continue as long as tubular fluid is alkaline

D- Decrease rapidly after first few days of an increase acid load

AN:A: due to the presence of glutaminase enzyme in the kidney

28- The substance that secreted by renal tubule is helpful in measuring the following except

: A- RBF B- RPF C- filtration fraction D- tubular maximum E- GFR

AN:E: GFR depends only on filtration. RPF is influenced by filtration,secretion and reabsorption. RBF needs RPF to be measured. Filtration fraction needs RPF and GFR to be measured. Tm depends on both secretion and reabsorption.

29- Measurement of RPF require determination of :

A- GFR

B- Filtered load of the test substance

C- Tm of test substance

D- Rate of reabsorption of the test substance

E- Urinary excretion rate of test substance

AN:E: because the equation of RPF = amount of substance in urine (volume × con)/con of substance in plasma

30- Passage of particles from glomerulus to bowman's capsule is described as :

A-Bulk flow B- osmosis.

C- diffusion D- active transport

AN: A, because of great amount of the filtered substances

31- The highest rates of plasma clearance are generally found in :

a. Cations
b. Anions
c. Metabolic end products
d. Forgein non-metabolized substances

AN:D:they are only secreted and never reabsorbed.

32- The lowest rate of plasma clearance is found in :

a. Creatinine b. glucose c. urea d. Cl

AN: B, normally it is completely reabsorbed in the PCT.

33- GFR is :

a. Decreased in cases of shock
b. Increased when plasma oncotic pressure falls
c. Increased when osmtic pressure increase in Bowman's capsule
d. Decrease by sympathetic stimulation
e. All of above

AN:E: shock can not be auroregulated >decrease RBF > decrease GFR , decrease OP and increase Bowman's capsular osmotic pressure >decrease the opposing force of filtration > increase GFR , sympathetic stimulation > VC of glomerular arterioles specially the afferent > decrease RBF > decrease GFR

34- The glomerular filtrate :

a. Has PH 7 b. Has osmolality of about 100 mOsm/litre
c. Has the same con. Of urea as in plasma
d. Is totally free from proteins

AN:C: urea is freely filtered in glomerular membrane

35- The active tubular reabsorption :

a. Is more important than secretion in urine formation
b. Return essential substances to glomerular capillaries
c. Cause complete clearance of plasma from glucose
d. Leads to partial clearance of plasma from urea

AN:A: because it returns all essential substances to the blood and the main cause of production hyperosmolality in renal MI (as a result of active transport of Na K and Cl into MI) which cause urine concentration.

36- LH of cortical nephron :

a. Don't participate in the urinary diluting mechanism
b. Are functionally unimportant in the renal conservation of Na and water
c. Don't contribute to the medullary osmotic gradient
d. Are necessary for production of medullary hypertonicity

AN:C: because it doesn't penetrate deeply into inner part of renal medulla.

37- In chronic renal filure,all the following are reduced except :

a. Blood PH
b. Blood Ca
c. Serum P & creatinine
d. Serum HCO3

AN:C: they increase because their clearance from plasma and excretion in urine is decreased

38- In the renal medulla, all the following take place except :

a. High osmolality built up from outside inwards
b. Na & Cl are actively pumped in the ascending limb of LH
c. Aldosterone play an important role in countercurrent mechanism
d. Urea trapped in MI
e. Urea passively diffuses from CD to MI

AN:C: it acts in late part of DCT and CCD which are located in the cortex not medulla.

39- About GF :

a. Has the same composition as urine
b. Occurs by passive process
c. Contains all constituent of the plasma
d. Occurs through glomerular afferent arteriole
e. Normally it is about 650ml/min

AN:B: filtration depends on glomerular capillary pressure not on presence or absence of ATP

40- Which of the following leads to highest filtration pressure :

a. VD of afferent arteriole + VC of efferent arteriole
b. VC of afferent arteriole + VD of efferent arteriole
c. VD of both
d. VC of both

AN:A: VD of AA > increase RBF , VC of EA > increase glomerular capillary pressure

41- In complete absence of ADH ,daily urinary output is about :

a. 5 L b. 10 L c. 20 L d. 50 L

AN:C: because in this case the whole CD become impermeable to water > excreted in urine (polyuria)

42- Filtration coefficient in the glomeruli is approximately :

a. 12 ml/mmHg/min
b. 60 ml/mmHg/min
c. 5 ml/mmHg/min

AN:A: GFR = Kf *NFP so Kf = GFR/NFP> Kf = 125/10 = 12.5

43- Plasma inulin 20 mg% , urinary inulin 8 mg/ml and urine volume 2ml/min GFR = : a. 50 ml/min
b. 80 ml/min
c. 120 ml/min
d. 180 ml/min

AN:B: GFR = urine volume * urinary inulin / (plasma inulin/ml) > GFR = 2*8/ (20/100) = 80 ml/min Note : 20 mg% = 20 mg /dl = 20 mg / 100 ml

44- In kidney :

a. Half of plasma flow through glomeruli is filtered
b. Over 95% of the filtered Na is actively reabsorbed in PCT
c. Tubular fluid entering the DCT is hypotonic
d. K is reabsorbed in PCT only when K intake is low

AN:C: because of reabsorption of solutes from tubular fluid in ascending limb of LH into MI.

45- The Tm of certain substances :

a. Is measured in ml plasma /min
b. Depends on plasma con of the substance
c. Depends on GFR
d. May be reduce in kidney disease

AN:D: because it depends on the reabsorptive and secretory force of the kidney (the strongest nephron).

46- Prolonged hyperventilation is normally accompanied by increased :

a. HCO3 absorption by the kidney
b. NH4 excretion by the kidney
c. HCO3 excretion by the kidney
d. Pco2 in the arterial blood

AN:C: hyperventilatin > respiratory alkalosis > renal correction by decrease H secretion (as a result of decrease CO2 in plood and consecuently in renal tubular cells) which lead to incomplete reabsorption of HCO3 > HCO3 excretion In urine

47- In the renal tubular fluid , H is buffered by all except:

a. HCO3 b. P c. Ammonia d. protein

AN:D: protein is neither secreted nor filtered.

48- The quantity of urea in the tubular fluid is unchanged in the :

a. PCT b. LH c. DCT d. CD

AN:C: initial part is impermeable ,late part is poorly permeable.in addition it doesn't affected by ADH.

49- Which of the following statements is wrong :

a. Normal RBF is about 21% of CO
b. Normal glomerular capillary pressure is 60 mmHg
c. Normal PH of ECF is 7.4
d. A report about urea clearance to be 65gm/day is nonsense
e. Normal GFR is about 125 litre/min

AN:E: normal GFR 125 ml/min

50- The substance with greatest reabsorption load in the renal tubule is :

a. Glucose. B. urea c. Na d. K e. Cl

AN:C: because It is reabsorbed by primary active transport allover the renal tubule except in the ascending thin segment of LH passively.

51- All the following statements are correct except :

a. RBF is decreased during muscular exercise
b. Creatinine is minimally reabsorbed in the renal tubules
c. Facultative water reabsorption determine the urine concentration or dilution
d. Obligatory water reabsorption occurs in PCT
e. The kidney depends mainly on extrinsic regulation

AN:E: GFR & RBF is regulated by prostaglandin and renin which are secreted by kidney.

52- Concerning the renal function:

a. The volume flow through the LH is smaller than that of CD
b. Ammonia is not synthesized in kidney
c. The highest concentration produced by the kidney is 2000 mOsm/L
d. Urinary rate of K excretion is dependent on the secretion of H in renal tubules e. Diamox increase H secretion
f. Hyperosmolality of MI is produced by KCl

AN:D : acidosis > increase H secretion > decrease K secretion because they both compete for secretion in DCT &CCD .

53- Aldosterone causes an increase of :

a. Na reabsorption by the renal tubules
b. Extracellular fluid volume
c. Na/K ratio in the ECF
d. K secretion by the renal tubules
e. All of above

AN:E: aldosterone increases the activity of Na-K ATPase and increases the activity and synthesis of Na channels in the apical membrane of tubular cells thus increasing Na reabsorption in exchange with K secretion. Na reabsorption is associated with Cl and water reabsorption >>>>

increase ECF volume. Na reabsorption and K Secretion >>>>> +Na >>>>> increase Na/K ratio.

54- The micturition reflex :

a. Is followed by a period of inhibition of sacral centres
b. Function only rarely in healthy adult individuals
c. Is acortical reflex mediated by sympathetic stimulation
d. All of above

AN:A: to prevent dribbling of urine and it is produced by CMC.

55- The greatest buffering power in the blood is by :

a. HCO3 b. P c. plasma protein d. haemoglobin D: because of its high concentration.

56- Which of the following is wrong :

a. DM is improved by administration of ADH
b. The bulk of H secretion occurs in PCT under normal condition
c. Sudden increase in alveolar ventilation causes acidosis
d. In case of non-respiratory acidosis, respiratory correction is partial.

AN:C: increase alveolar ventilation >>>> decrease Pco2 >>>> the (R) HCO3/Pco2 increase >> PH increase above 7.4 >>>> alkalosis.

57- An acid PH of ECF causes :

a. Decrease synthesis of ammonia in renal tubule
b. Excessive loss of K from PCT
c. Increase reabsorption of filtered Cl
d. Increase reabsorption of filtered HCO3

AN:D: in acid PH (acidosis) cause excess H secretion allover renal tubules and this is buffered by HCO3, ammonia and phosphate >>> this cause complete reabsorption of HCO3 in PCT and increase formation and addition of HCO3 to the blood in PCT, DCT and CD.

58- Severe diarrhea tends to cause metabolic acidosis because :

a. Infection causing diarrhea form excessive acid
b. Gastric HCl is no longer neutralized by duodenal secretion
c. Lose of intestinal secretion containing large amount of HCO3
d. Kidney tends to retain H when the body loses water

AN:C: loss of HCO3 >>> HCO3/Pco2 decrease >>> PH decrease >>> acidosis

59- In acute renal failure , acidosis tends to develop because :

a. Respiratory centre respond to increase H by depression of ventilation
b. Normally, excess acid is formed over alkali in the body
c. The kidney normally has difficulty in excreting acid than alkali
d. Rapid loss of NaHCO3 by insufficient kidney

AN:B: the products of metabolism in the body is acid (CO2 and fixed acids) and this can not excreted by kidney >>> leading to its accumulation in the body >>> acidosis

60- Chronic renal insufficiency is characterized by :

a. Small daily urine volume which is concentrated
b. Large daily urine volume with fixed specific gravity
c. Small quantity of osmotic particles excreted per day
d. A tendency to develop hypotension and macrocytic anemia

AN:B: chronic renal failure leads to polyuria by – in the still functioning nephron A- RBF & GFR increase by 50-100% B- extraload of excretory products cause an osmotic diuretic effect Also in chronic RF there is isosthenurea (persistent excretion of isoosmic urine) >>> fixed SG

61- The dialyzing fluid in artificial kidney should contain :

a. Lower Na con than the blood
b. No K ions
c. Higher lactate con than that of blood

d. The same Cl and higher glucose than that of blood
e. Large amount of lactate and creatinine

AN:D: Cl should be in the blood in a constant con. without diffusion , glucose is essential substance should diffuse to the blood.

62- In respiratory alkalosis, the blood:

a. Blood PH is low , and HCO3 con is high Pco2 is normal
b. Blood PH is high , and HCO3 con is low Pco2 is normal
c. Blood PH is high , and HCO3 con Pco2 are low

AN:C: respiratory alkalosis >>> Pco2 is decreased so (R) is increased >>>> PH is increased >>> renal correction by HCO3 excretin but in uncompensated case both are lower than normal but not proportionally so PH still high.

63- Renal threshold of glucose is decreased by :

a. Increase or decrease of GFR
b. Administration of phlorhizin
c. Increase in the tubular transport of glucose

AN:B: phlorhizin compete glucose for binding of its transporter in PCT (SGLT 2)

64- Chronic RF is associated with all except:

a. Elevation of blood level of creatinine and urea
b. Hyperkalemia and hypocalcaemia
c. Anemia
d. Metabolic acidosis
e. Oliguria with increased SG of urine above 1100

AN:E: CRF is associated with polyuria and fixed SG

65- GFR increase in case of :

a. Ureteric obstruction b. Mild hypertension
c. sympathetic stimulation d. severe malnutrition

AN:D: severe malnutrition >>>> protein catabolism >>> increase Bowman's capsular oncotic pressure as a result of increase protein filtration >>>> increase NFP

Endocrine System

1-which of these statement about hypothalamic releasing hormone is true

a-they are secreted into capillary in median eminence
b-they are transported ny portal vein into anterior pituitary
c-they stimulate the secretion of specific hormone from anterior pituitary
d-all of these are true
Answer: D, circulation of hypothalamic releasing hormone
Hypothalamus <primary capillary plexus in median eminence <portal veins <secondary capillary plexus in anterior pituitary gland >anterior pituitary gland (to stimulate the secretion of specific hormone)

2-steroid hormone are secreted by :

a-the adrenal cortex
b-the gonads
c-the thyroid
d- a and b
e-b and c
Answer: D, steroid hormones are secreted by adrenal cortex(aldosterone-androgen-cortisol)-
-gonads (testosterone-estrogen-progesterone)
- active form of vitamin D3

3-ADH

a-cause water retention by action on V1a receptor
b-produce V.C by its physiological level
c-release is stimulated by hypervolemia
d-release is inhibited by alcohol
Answer: D, ADH cause water retention by action on V2 and produce V.C if it present in high level and its release stimulated by hypovolemia and inhibited by alcohol

4- Oxytocin

a-is released mainly from superoptic nucleus of hypothalamus
b-cause utrine contraction during normal pregnancy
c-stimulate milk secretion by acini of mammary glands
d-secretion during lactation results from neuro-endocrine reflex
e-cause squeeze of eccrine glands
Answer: D, oxytocin is secreted mainly from paraventericular nucleus of hypothalamus,

also it stimulate the myoepithelial cell to squeezing milk out ,not secrete(function of prolactin) but ejaculate , it does not related to eccrine.

5-ACTH performs all the following actions except:
a-it increases the cholesterol uptake by zona fasciculate cells leading to increased synthesis and secretion of glucocorticoid hormones.
b-it stimulates the androgen secretion from zona reticularis cells.
c-it maximally stimulates aldosterone secretion
d-it stimulates the melanin formation by melanocytes
e-it can inhibit the release of CRH from the hypothalamus via a short loop feedback
Answer: C, it maximally stimulates cortisol

6-about the aldosterone:
a-is the most important glucocorticoid hormone.
b-plays a major role in regulation of ECF volume.
c-helps Na+ secretion and K+ reabsorption I renal tubules.
d-controls the synthesis of 1.25 dihydroxycholecalciferol
Answer:B, regulation of ECF by regulation the reabsorption of Na+

7- excess administration of cortisol causes:
a-decreased Na+ level in plasma
b-increased fat catabolism leading to increased FFA level in blood
c-high rate of ACTH secretion
d-decreased concentration of amino acids in the blood
e- increased ca++ deposition in the bones
Answer: B, because it have lipolytic effect

8- the thyroid hormone act through:
a-binding to membrane receptors in the target cells
b-reacting with cytoplasmic receptor
c- increasing cAMP in target cells
d-increasing cGMP in the target cells
e- reacting with nuclear receptor leading to increased mRNA formation
Answer: E, the receptor of thyroid hormone is nuclear receptor

9-insulin increases the uptake of glucose by all the following tissue except the:
a-intestinal mucosa

b-adipose tissue
c-skeletal muscles
d- cardiac muscle
e- uterus

10-vasopressin
a-is chemically a steroid hormone
b-excess leads to diabetes insipidus
c-performs its actions by activating adenyl cyclase enzyme
d-secretion is inhibited by morphin and stimulated by alcohol
e-excess is associated with hypotension
Answer: C, adenyl cyclase –cAMP-protein kinase

11-insulin-like growth factor 1 :
a-is produced by liver and the other tissues
b-promote the fetal tissue growth in the intrauterine life
c-absence does not affect the growth promotion
d-has strong insulin-like and antilipolytic action
Answer: A, the it have weak insulin like affect and produced by liver

12-insulin increase the entry of glucose into:
a-all tissues
b- renal tubular cells
c-neuron of cerebral cortex
d-skeletal muscles
Answer: D, insulin increase the entry of glucose to skeletal muscles+ lipid tissue +liver

13-which of following exert the greatest effect on parathyroid hormone secretion:
a-plasma phosphate concentration
b-calcitonin
c-1,25 dihydroxycholecalciferole
d-the plasma Ca+2 concentration
Answer: D, the Ca++ mainly regulates parathyroid hormone

14- all the following are endocrine glands not under the anterior pituitary control except
a-parathyroid gland
b-posterior pituitary

c-thyroid gland
d-adrenal medulla
Answer: C, the glands under the control of anterior pituitary is thyroid , adrenal cortex and gonads

15-all the following are the biochemical effects of cortisol except :
a-hepatic lipogenesis
b-hepatic protein anabolism
c-hepatic gluconeogenesis
d-hepatic glycogenesis
Answer: D, because the cortisol increase blood level of glucose and the glycogenesis decrease the blood glucose level

16-insulin deposition of fats:
a-increases
b-decreases
c-dose not affect
Answer: A, because insulin leads to lipogenesis

17-which of the these is not an endocrine property
a-hormone reach targets through the blood
b-effects are slow and cyclic
c-rapid acting effects
d-effects caused by chemicals
Answer: C, endocrine have slow acting effect in contrast to nervous which has rapid acting effects

18-low blood glucose typically result in the secretion of all the following except:
a-glucagon
b-thyroxine
c-hGH
d-PTH
e- 3 of the above
Answer: D

19-which of following is the function of glucocorticoids:
a-increased inflammatory response
b-increased blood (glucose)
c-decreased lipolysis
d-increased creatinine hydrolysis by osteocytes
e-increased osteoclast activity
Answer: B, it increase blood glucose level

20-all of following are biochemical effects of cortisol except:
a-hepatic lipogenesis
b-hepatic gluconeogenesis
c-hepatic protein anabolism
d-hepatic glycogenesis
Answer: D

21-parathormone :
a-increase the ca++ absorption from intestine directly
b-mobilizes calcium from bone independently of its action on kidney
c-it increases phosphate reabsorption in proximal convoluted tubules of the kidney
d-in the blood is decreased in amount when the calcium level falls
Answer: B

22-concerning glucagon secretion all of the following are true except :
a-is stimulated by hypoglycemia
b-is inhibited by cortisol
c-is inhibited by secretin hormone
d- is stimulated by sympathetic
Answer: B, because stress increase glucagon secretion and the main hormone of stress is cortisol

23-aldosterone :
a-secretion markedly increases in case of haemorrhage
b-acts mainly at the proximal convoluted tubules of the kidney
c-is secreted In response to ingestion of NaCl or in increased blood volume
d-promote Na+ secretion and K+ retension
Answer: A due to decrease of blood volume

24-oxytocin is secreted by the :
a-adenohypophysis
b-neurohypophysis
c-zona glomerulocsa
d-pars intermedia
cervical stretch receptors
Answer: B, by posterior pituitary gland

25-which of following inhibits the secretion of growth hormone :
a-sleep
b-stress
c-puberty
d-somatomedin c
e- starvation
Answer: D, by negative feedback

26-which of the following has the greatest effect in Na+ excretion:
a-progesterone
b-cortisol
c-vasopressin
d-aldosterone
e-dehydroepiandrosterone
Answer: D the aldosterone by regulation of reabsorption of Na+

27-in the pancreas which of the following cells secrete insulin decrease the blood level of the glucose :
a-delta
b-alpha
c-beta
d-all of above
Answer: C

28-primary target of the releasing and inhibiting hormone of the hypothalamus is the
a-liver and adipose tissue
b-gonads
c-anterior pituitary

d- bone marrow
Answer: C, reach the anterior pituitary gland by hypothalamo-hypophyseal portal circulation

29- the clusters of cells in the pancreas that produce hormones are the
a-nodlules
b-islets of Langerhans
c-pancreatic medulla
d-pancreatic cortex
Answer: B

30-the glucagon is
a-accelerates the conversion of glycogen into glucose
b-slows down glucose formation from lactic acid
c-decreases the conversion of glycogen into glucose
d-speeds up protein synthesis within cells
Answer: A, this conversion to increase the blood glucose level

31-most hormones of the endocrine system are regulated by a
a-negative feedback mechanism
b-positive feedback mechanism
c-hormone-receptor complex
d-hormone-gene complex
Answer: A, the most important mechanism in the endocrine system

32- the insulin increase the movement of which of the following glucose transporter into the cell membrane of skeletal muscle cells
a-GlLUT1
b-GLUT2
c-GLUT3
d-GLUT4
e-SGLT1
Answer: D, the insulin act only on GLUT4

Central Nervous System

Section 1: General Functional Organization of the Nervous System

1) The central nervous system includes all the following components, except :-
a- spinal cord
b- medulla oblongata
c- autonomic ganglia
d- diencephalon

Check your Answers in page 111-112

2) The central nervous system is connected with the peripheral nervous system by all the following types of nerve fibers, except :-
a- postganglionic autonomic fibers
b- preganglionic autonomic fibers
c- somatic motor fibers
d- autonomic sensory fibers

3) The sensory system is involved in all the following, except :-
a- initiation of reflex movements
b- initiation of voluntary movements
c- learning processes
d- initiation of emotional responses

Section 2: Sensory System and Sensory Receptors

1) The two-element sensory receptors differ from other types of receptors in being:-
a- more numerous
b- more widely spread in the body
c- more sensitive
d- composed of specialized cells at the sensory nerve terminals

2) Sensory receptors are classified functionally according to the following criteria, except :-
a- their location in the body
b- the nature of tissues in which they are found
c- the nature of stimuli acting on them
d- their connection with cerebral coretx

3) Most sensory receptors :-

a- are stimulated by different types of stimuli

b- are stimulated only by specific stimuli

c- posses a high threshold for their specific stimuli

d- only ‘b’ and ‘c’ are correct

4) A specific stimulus produces a receptor potential by :-

a- inhibiting Na + influx into receptor

b- inhibiting K + efflux from receptor

c- enhancing Na + influx into receptor

d- enhancing K + efflux from receptor

5) Receptor potential initiated by an adequate stimulus :-

a- develops always at it full magnitudes

b- undergoes temporal summation only

c- undergoes spatial summation only

d- could initiate an action potential

6) Once initiated, the receptor potential :-

a- spreads to a long distance along the sensory nerve fiber

b- amplitude is not related to the strength of the stimulus

c- always generates an action potential from the receptor

d- stays for a variable period depending on the type of the receptor

7) Receptor potential generates:-

a- an electrotonic current which is transmitted along sensory fibers to the CNS

b- a nerve impulse at the receptive region of the receptor

c- a state of hyperpolarization of the receptor membrane

d- a nerve impulse at the spike initiating region of the receptor

8) When stimulated by effective steady stimuli, sensory receptors :-

a- continuously discharge impulses

b- stop discharging after a short time

c- produce an initial high rate of impulse discharge followed by decline of this rate

d- differ in their response ; some types discharge continuously, while other types do not respond at all

9) Slowly adapting receptors include all the following types, except :-
a- Golgi tendon organs
b- warmth receptors
c- free nerve endings
d- Meissner corpuscles

10) Slowly adapting receptors differ from rapidly adapting receptors in :-
a- stopping to discharge after a relatively longer period of constant stimulation
b- detecting the dynamic properties of stimuli
c- detecting velocity of stimuli
d- generating receptor potentials as long as stimulus is applied.

11) Rapidly adapting receptors are involved in :-
a- static reflex responses
b- detection of joint movements
c- regulation of heart rate
d- only 'a' and 'b' are correct

12) Receptors detect stimulus intensity by :-
a- lowering the threshold for receptor stimulation
b- by generating receptor potentials having higher magnitudes
c- by generating nerve impulses that are transmitted along sensory fibers at higher velocities
d- by enhancing the central effects of sensory impulses

<u>Section 3: Sensation and Coding of Sensory Information</u>
1) General sensations :-
a- originate from all sensory receptors of the body
b- are mediated by somatic sensory fibers only
c- include the sense of movement
d- include the sense of equilibrium
2) Detection of the stimulus modality depends upon :-
a- the location of the receptors in the body
b- the magnitude of the stimulus
c- the anatomical connections between the receptors and specific sensory areas in the cerebral cortex
d- the magnitude of the receptor potential

3) Receptors detect stimulus intensity by :-
a- lowering the threshold for stimulating receptors
b- raising the threshold for stimulating receptors
c- decreasing the magnitude of receptor potential
d- raising the magnitude of receptor potential

4) The ability to localize the site of stimuli depends upon :-
a- the type of the stimulated receptor
b- connections between the receptor and the sensory cortex
c- the rate of adaptation of the stimulated receptors
d- the nature of the stimulus

Section 4: Mechanoreceptive Sensations

1) Touch receptors :-
a- are found only in the skin
b- are all encapsulated receptors
c- include two-element receptors
d- are stimulated by vibration

2) Tactile receptors include all the following receptors, except :-
a- free nerve endings
b- hair follicle receptors
c- hair cell receptors
d- Ruffini nerve endings

3) Rapidly adapting tactile receptors include all the following types, except :-
a- Merkel discs
b- Meissner corpuscles
c- Pacinian corpuscles
d- hair end organs

4) Fine touch :-
a- is detected by slowly adapting touch receptors
b- is transmitted by the spinothalamic tract
c- is characterized by it emotional affect
d- is not involved in feeling the texture of touched objects

5) Crude touch is more effective than fine touch in evoking an emotional response because :-
a- its provoking stimuli are stronger
b- its central pathway connects with the limbic system
c- it is stimulated during emotional excitement
d- the provoking stimuli have an emotional nature

6) A more developed two-point tactile discrimination :-
a- indicates a greater threshold distance for feeling of two points of touch applied simultaneously
b- is seen in the proximal regions of the body compared with the distal regions
c- is inversely related to the size of the receptive fields of the stimulated sensory units
d- depends upon the type of the involved touch receptor

7) Proprioceptive sensations include all the following, except :-
a- position sense
b- equilibrium sense
c- movement sense
d- kinesthetic sense

8) Proprioceptors include all the following types of receptors, except :-
a- muscle spindles
b- pressure receptors
c- vestibular receptors
d- joint receptors

9) Proprioceptive sensations are transmitted by all the following pathways, except :-
a- spinothalamic tracts
b- spinocerebellar tract
c- gracile tract
d- cuneocerebellar tract

10) Astereognosis :-
a- indicates inability to localize the site of touch on the body surface
b- results from lesions of the secondary somatic sensory area
c- associates parietal lobe neglect
d- results from loss of crude touch sensation

11) Parietal lobe neglect :-
a- is characterized by inability to use skeletal muscles on the opposite side of the body
b- is characterized by inability to use skeletal muscles on the same side of the body
c- results from damage of primary sensory cortex.
d- causes loss of sensations on the same side of the body

Section 5: Pain Sensation

1) Pain sensation :-
a- is evoked by strong stimulation of specific receptors
b- produces reactions that block transmission of pain impulses
c- arises from small encapsulated receptors
d- occurs when the stimulus causes damage of the sensory receptors

2) Reaction to pain includes all the following, except :-
a- increased heart rate
b- depression
c- withdrawal reflexes
d- stoppage of impulse discharge from nociceptors in chronic painful conditions

3) Pain receptors :-
a- become more sensitive with prolonged stimulation
b- are stimulated by prostaglandins
c- are more numerous in viscera than other tissues
d- include different morphological types

4) Pain threshold :-
a- is the highest intensity of stimulus that causes pain
b- is the lowest intensity of stimulus that causes pain

c- differs markedly among different individuals
d- is elevated by substance P

5) Fast pain differs from slow pain in :-
a- being transmitted in the dorsal column pathway
b- evoking a depressor autonomic reaction
c- having a sharp quality
d- arising from encapsulated pain receptors

6) Double pain sensation that is occasionally felt following painful stimulation of the skin is due to :-
a- repetition of the painful stimulus
b- presence of dual pain pathways
c- perception of pain at two different higher centers
d- application of two painful stimuli simultaneously at two different sites

7) Cutaneous pain :-
a- is always sharp in character
b- is transmitted by Aδ sensory fibers
c- is always followed by hyperalgesia
d- evokes spasm of nearby muscles

8) Primary cutaneous hyperalgesia :-
a- develops in the normal skin region around the area of flare
b- is an abnormal condition in the skin in which painful stimuli become more severe
c- is due to changes in threshold of pain receptors
d- is associated with throbbing type of pain

9) Deep pain shows the following characteristics, except :-
a- dull aching
b- throbbing
c- evokes flexor reflexes
d- diffuse

10) Intermittent Claudications evoke :-
a- visceral pain

b- deep pain
c- cutaneous hyperalgesia
d- colicky pain

11) Pain produced by muscle spasm results from :-
a- mechanical stimulation of pain receptor by muscle spasm
b- decreased release of lactic acid from the spastic muscle fibers
c- release of compounds from the spastic muscle which increase the threshold for stimulation of pain receptors
d- decreased oxygen supply to the muscle

12) Visceral pain :-
a- is more common than the other types of pain
b- arises only from wall of the visceral organs
c- is often well localized
d- evokes depressor autonomic reactions

13) Stimuli which evoke true visceral pain include all the following, except :-
a- sharp cutting
b- stretching
c- spasm
d- chemical irritation

14) Visceral pain is usually felt :-
a- deeply in the diseased viscera
b- in deep tissues close to the diseased viscera
c- in skin areas that just overlie the diseased viscera
d- in skin areas remote from the diseased viscera

15) Intracranial headache could result from painful stimuli applied on :-
a- the dura lining the inner surface of the bones of cranial vault
b- the brain tissue
c- wall of big intracranial veins
d- arachnoid mater

16) Intracranial headache may result from all the following clinical causes, except :-

a- decreased CSF pressure
b- spasm of scalp muscles
c- distension of big venous sinuses
d- pressure upon tentorium cerebelli

17) Transmitters in pain control system include all the following, except :-
a- serotonin
b- acetylcholine
c- enkephalin
d- norepinephrine

18) Enkephalin binds best with :-
a- delta ‘δ’ opiate receptors
b- muta ‘μ’ opiate receptors
c- kappa ‘κ’ opiate receptors
d- all opiate receptors with equal affinity

19) Pain control system :-
a- is activated whenever a painful stimulus is applied to body tissues
b- is never activated naturally
c- is activated only by administration of opiate drugs
d- is activated naturally under conditions associated with strong emotional excitement

20) Enkephalin blocks pain transmission by :-
a- blocking the response of pain receptors to painful stimuli
b- slowing down transmission of pain impulses through synapses in the pain pathway
c- inhibiting the response of the cerebral cortical somatic sensory area to pain signals
d- blocking Ca ++ channels in the central terminals of pain sensory fibers

21) The spinal pain gate is :-
a- Ligand controlled
b- voltage controlled
c- opened by enkephalin
d- closed by substance P

Section 6: Thermal Sensations

1) Thermal sensations :-

a- are evoked by all changes in environmental temperatures
b- are evoked by stimulation of thermo-sensitive pain receptors
c- are involved in regulation of metabolic activity
d- are transmitted by Aβ sensory fibers

2) Thermal receptors are :-

a- slowly adapting receptors
b- rapidly adapting receptors
c- biphasic receptors
d- all encapsulated receptors

Section 7: Motor Functions of the Spinal Cord : Spinal Reflexes

1) Higher motor commands originate in all the following centers, except :-

a- cerebral cortex
b- thalamus
c- caudate nucleus
d- cerebellum

2) A reflex action :-

a- is a fast brief response to a sensory stimulus
b- is involved in regulation of voluntary movements
c- includes at least three sequential sets of neurons in its pathway
d- is always initiated whenever its specific receptors are effectively stimulated by a specific stimulus

3) Reflex actions could be classified according to :-

a- the type of sensory receptors initiating them
b- the type of afferent nerves mediating them
c- the type of efferent nerves mediating them
d- the type of neurotransmitters mediating them

4) Events of reflex actions include all the following, except :-
a- stimulation of sensory receptors
b- stimulation of central synapses
c- inhibition of sensory receptors
d- inhibition of central synapses

5) A reflex arc includes :-
a- at least two sets of sequential neurons
b- at least two sequential sets of central synapses
c- at least two types of sensory receptors
d- at least two types of efferent neurons

6) The central terminals of afferent neurons mediating spinal reflexes are distributed within the spinal cord, so that :-
a- all of them terminate in the same spinal segment of their entry to the cord
b- all of them terminate on interneurons
c- all of them subserve spinal reflexes
d- they provide pathways for divergence of the incoming sensory impulses

7) Interneurons :-
a- provide communication between the central ends of afferent neurons
b- provide communication between dendrites of the efferent neurons
c- influence the rate of discharge from the alpha motor neurons
d- participate in ascending sensory pathways

8) The divergence function of interneurons is involved in :-
a- temporal summation
b- spatial summation
c- reverberation
d- irradiation

9) Interneuron after-discharge circuits prolong the duration of :-
a- sensory input to the spinal motor centers
b- synaptic delay in central synapses
c- discharge of efferent neurons
d- conscious perception of the evoked sensation

10) A flexor withdrawal reflex shows all the following properties, except :-
a- recruitment
b- prepotent
c- non-fatigable
d- irradiation

11) Flexor reflexes do not involve :-
a- flexor muscles
b- extensor muscles
c- reciprocal inhibition
d- reflex spasm of the involved muscles

12) The ability of stronger stimuli to produce wider range of reflex responses depends upon :-
a- presence of reverberating circuits in reflex pathway
b- presence of parallel-chain circuits in reflex pathway
c- convergence of interneurons
d- divergence of interneurons

13) Recruitment of a reflex response is due to :-
a- difference in the amount of presynaptic inputs to the various efferent neurons initiating the reflex
b- difference in the conduction velocity of the various afferent neurons mediating the reflex
c- delay at the neuromuscular junction
d- presence of inhibitory interneurons in the reflex pathway

14) After-discharge of reflex responses :-
a- increase the magnitude of the reflex responses
b- delays the onset of fatigue of reflex responses
c- involves interneuron circuits
d- depends upon spatial summation

15) Central delay of reflex actions :-
a- is due to presence of inhibitory interneurons in the reflex pathway
b- is the time between stimulation of receptors and response of the effector muscle

c- is longer in the flexor reflex than in the stretch reflex
d- is determined by the velocity of conduction of impulses along the afferent and efferent neurons in the reflex pathway

16) Fatigue of reflexes :-
a- develops gradually and recovers rapidly
b- develops rapidly and recovers slowly
c- develops gradually and recovers slowly
d- develops rapidly and recovers rapidly

17) In flexor withdrawal reflexes contraction of flexor muscles is associated with reciprocal inhibition of :-
a- synergistic flexor muscles
b- contralateral extensor muscles
c- ipsilateral extensor muscles
d- both 'a' and 'b' are correct

18) Reciprocal inhibition between reflexes depends upon all the following, except :-
a- presence of inhibitory interneurons in the reflex pathways
b- presence of excitatory interneurons in the reflex pathways
c- presence of anion channels in membranes of the involved neurons
d- release of inhibitory transmitters which block cation channels in the reflex pathways

19) stretch reflex is characterized by the following except :-
a- disynaptic reflex
b- high localization
c- shows reciprocal innervations.
d- it is of graded response

20) Stretch of an innervated muscle evokes :-
a- contraction of its spindles
b- contraction of its extrafusal fibers
c- contraction of antagonistic muscles
d- relaxation of synergistic muscles

21) Muscle spindles :-
a- are found in all skeletal muscles
b- are found only in large skeletal muscles
c- consist of small numbers of extrafusal muscle fibers
d- consist of a large number of extrafusal muscle fibers

22) The nuclear-bag fibers of muscle spindles are innervated by :-
a- Aγ nerve fibers
b- Aβ nerve fibers
c- Aδ nerve fibers
d- Ia nerve fibers

23) The nuclear-chain fibers of spindles are innervated by :-
a- Aα and Aδ nerve fibers
b- Aδ and C nerve fibers
c- Ia and II nerve fibers
d- only type II nerve fibers

24) The central ends of afferents from muscle spindles synapse with all the following types of neurons, except :-
a- α-motor neurons of the same muscle
b- γ-motor neurons of the same muscle
c- local interneurons
d- 2nd order neurons of ascending sensory pathways

25) γ-motor innervation of muscle spindles produces :-
a- contraction of the central region of the spindle fibers
b- increased sensory discharge from the central region of the spindle fibers
c- decreased sensory discharge from the central region of the spindle fibers
d- relaxation of the peripheral regions of the spindle fibers

26) Discharge from muscle spindles could be increased by all the following, except :-
a- increased α-motor neuron discharge
b- increased γ-motor neuron discharge
c- stretch of the intrafusal muscle fibers
d- stretch of the extrafusal muscle fibers

27) Increased γ-motor neuron discharge stimulates muscle spindles, because :-
a- it produces stretch of the extrafusal muscle fibers
b- it causes stretch of the peripheral regions of the intrafusal fibers
c- it causes stretch of the central region of the intrafusal fibers
d- it stimulates directly the sensory fibers innervating muscle spindles

28) γ-motor neuron discharge to a muscle is inhibited by impulses reaching the γ-motor neurons from all the following source, except :-
a- Golgi tendon organs of the same muscle
b- spindles of antagonistic muscles
c- medullary reticular formation
d- pontine reticular formation

29) When the γ-motor neuron discharge to a muscle decreases, it causes :-
a- increased muscle spindle discharge
b- shortening of the spindle fibers
c- stronger contraction of the extrafusal muscle fibers
d- decreased spindle sensitivity to stretch

30) The role of muscle spindles in the maintenance of the upright posture depends upon all the following, except :-
a- contraction of the peripheral contractile part of spindle fibers
b- increased sensory discharge from spindles of postural muscles
c- increased supraspinal facilitation to the γ-motor neurons of postural muscles
d- presence of greater numbers of spindles in postural muscles

31) The role of γ-motor neurons in regulation of equilibrium is achieved by :-
a- initiating contraction of spindle fibers which directly antagonize postural deviation
b- increasing spindle sensitivity to stretch
c- directly stimulating extrafusal muscle fibers to antagonize postural deviation
d- directly adjusting the discharge of α-motor neurons innervating the extrafusal muscle fibers to antagonize postural deviation

32) interruption of γ-motor neuron discharge to a skeletal muscle produces :-
a- contraction of the muscle
b- contraction of the spindle fibers
c- relaxation of the spindle fibers
d- increased sensory discharge from the spindle fibers

33) Co-activation of α and γ-motor neurons :-
a- increases γ-motor neuron discharge whenever the activity of α-motor neurons rises to a high level
b- is mediated by interneurons that link the α and γ-motor neurons
c- maintains the proprioceptive information to higher centers during muscle contraction
d- increases the α-motor neuron discharge whenever the activity of γ-motor neurons rises to a high level

34) Increased sensory discharge from muscle spindles :-
a- decreases muscle tone
b- increases muscle tone
c- could either increase or decrease muscle tone according to the muscle affected
d- has no effect on muscle tone

35) Interruption of spindle discharge from a muscle causes contraction of the muscle to become jerky and irregular due to :-
a- increased activity of reverberating circuits causing fluctuation of the motor discharge to the muscle
b- increased activity of inhibitory interneurons causing oscillating inhibition of the α-motor neurons of the muscle
c- irregular discharge of excitatory inputs to the α-motor neurons of the muscle
d- post-tetanic potentiation of the α-motor neurons of the muscle

36) Whenever the position of a joint is stabilized at a certain attitude, the nervous system produces this by :-
a- increasing the α-motor neuron discharge to all muscles attached to the joint
b- increasing the γ-motor neuron discharge to all muscles attached to the joint
c- increasing γ-motor neuron discharge to postural muscles
d- co-activation of α and γ-motor neurons innervating the involved muscles

37) The highly localized nature of stretch reflex is due to :-
a- the limited number of interneurons in the reflex pathway
b- all the central ends of afferents from spindles of the stretched muscle terminate on the α -motor neurons of the muscle
c- the α -motor neurons of the stretched muscle receive most of the central terminals of afferents coming from spindles of the muscle
d- activation of inhibitory interneurons which inhibit the motor neurons of the surrounding muscles

38) The shortest reflex time is recorded with :-
a- a flexor withdrawal reflex
b-an inverse stretch reflex
c- a stretch reflex
d- a scratch reflex

39) When a skeletal muscle is suddenly stretched :-
a- it relaxes suddenly
b- it develops a static stretch reflex
c- it develops a dynamic stretch reflex
d- it develops clonic contractions

40) Sensory impulses from spindles of a stretched muscle could inhibit antagonistic muscles by :-
a- directly inhibiting γ-motor neurons of the antagonistic muscles
b- directly inhibiting the α -motor neurons of the antagonistic muscles
c- inhibiting the transmitter release from the central terminals of afferents from the spindles of the antagonistic muscles
d- activation of inhibitory interneurons

41) Antigarvity muscles maintain stretch reflex for prolonged periods without fatigue, because :-
a- they are heavily innervated by α -motor neurons
b- they obtain their energy needs mainly from anaerobic metabolic processes
c- they contain exceptionally high levels of creatine phosphate
d- they are rich in mitochondria

42) The discharge from Golgi tendon organs initiated by excessive stretch of a skeletal muscle produces :-
a- inhibition of α -motor neurons of antagonistic muscles
b- inhibition of γ-motor neurons of antagonistic muscles
c- inhibition of α -motor neurons of the same muscle
d- stimulation of γ-motor neurons of the same muscle

43) Inverse stretch reflex :-
a- increases the possibility of avulsion of the excessively stretched muscle from its bony attachments
b- has no reciprocal innervation circuits
c- is clinically manifested by lengthening reaction
d- is clinically tested by examining the tendon jerks

44) Skeletal muscle tone :-
a- is a dynamic stretch reflex
b- has a dynamic state
c- is increased during rest
d- is decreased during standing upright

45) γ-motor neurons control muscle tone by :-
a- adjusting the supraspinal facilitatory discharge
b- adjusting the α -motor neuron discharge
c- adjusting the muscle spindle discharge
d- adjusting the activity of interneurons in the reflex arc of muscle tone

46) Adequate level of muscle tone is essential for the accurate performance of voluntary movements, because :-
a- it adjusts the α -motor neuron discharge initiating voluntary movements
b- it adjusts posture of proximal joints of the acting limbs
c- it adjusts the upright posture of the whole body during voluntary movements
d- it adjusts sensitivity of the spindles of the involved muscles

47) A tendon jerk :-
a- is a dynamic stretch reflex
b- is a static stretch reflex
c- is evoked by gradually stretching the muscle

d- is evoked by stimulation of tendon receptors

48) The tendon jerk which has its center in the 5th and 6th cervical segments of the spinal cord is :-
a- the jaw jerk
b- the deltoid jerk
c- the biceps jerk
d- the triceps jerk

49) Tendon jerks are clinically examined to asses :-
a- integrity of muscle spindles
b- integrity of reflex pathway
c- the total reflex time of the jerk
d- central delay time of the jerk

50) Absence of a tendon jerk could result from any of the following conditions, except :-
a- lesions of supraspinal facilitatory centers
b- lesions of the efferent neurons
c- lesions of the afferent neurons
d- lesions of the spinal nerve centers

51) Exaggeration of tendon jerks could result from any of the following conditions, except :-
a- lesions of supraspinal facilitatory centers
b- lesions of supraspinal inhibitory centers
c- increased γ-motor neuron discharge
d- anxiety

52) Clonus :-
a- is a sign of decreased supraspinal facilitation
b- initiated by briefly stretching the tendon of the muscle
c- is manifested as oscillating mechanical vibrations following tendon jerks
d- associates exaggeration of tendon jerks

Section 8: The Descending Motor Systems

1) All of the following are descending motor tracts, except :-

a- Rubrospinal tract
b- Spinotectal tract
c- Reticulospinal tract
d- Corticobulbar tract

2) Corticospinal tract originates from all the following areas, except :-

a- premotor area in the frontal lobe
b- prefrontal area in the frontal lobe
c- supplemental motor area in the frontal lobe
d- somatic sensory area in the parietal lobe

3) The cranial motor nuclei which receive innervation only from the contralateral corticobulbar tract are :-

a- nuclei of the trigeminal and vagus nerves
b- nuclei of the vagus and glossopharyngeal nerves
c- nuclei of the facial and hypoglossal nerves
d- nuclei of the facial and glossopharyngeal nerves

4) Axons of the lateral corticospinal tract synapse mainly with :-

a- lateral motor neurons
b- medial motor neurons
c- intermediolateral neurons
d- interneurons

5) The lateral motor system includes :-

a- the lateral Reticulospinal tract
b- the lateral corticospinal tract
c- the lateral vestibulospinal tract
d- all the above tracts

6) The corticobulbospinal tract is involved in all the following, except :-

a- voluntary movements
b- postural adjustment
c- automatic movements
d- initiation of tendon jerks

7) The Rubrospinal tract :-
a- originates from the pontine reticular formation
b- descends contralaterally
c- controls activity of axial muscles
d- is a component of the medial motor system

8) The reticulospinal tracts :-
a- are inhibitory to muscle tone
b- are excitatory to muscle tone
c- are either excitatory or inhibitory to muscle tone
d- have effect on muscle tone

9) Vestibulospinal tracts :-
a- adjust the discharge of vestibular receptors
b- adjust muscle tone
c- antagonize the effects of rubrospinal tract
d- terminate on the lateral motor neurons in the spinal cord

10) Tectospinal tract :-
a- originate mainly from the inferior colliculus
b- originate mainly from the medial geniculate body
c- mediate responses initiated by sudden changes of head position
d- terminate in the cervical segments of the cord

11) representation of the body in the primary motor area :-
a- is ipsilateral
b- is upright
c- is disproportionate to the actual anatomical size of the represented region
d- all the above are correct

12) the primary motor area receives inputs arising from all the following
centers, except :-
a- basal ganglia
b- cerebellum
c- hypothalamus
d- thalamus

13) The primary motor area projects efferent fibers to all the following centers, except :-
a- 1ry somatic sensory area
b- premotor area
c- supplemental motor area
d- brainstem motor nuclei

14) The premotor area includes all the following, except :-
a- Broca's area
b- head rotation area
c- supplemental motor area
d- hand skills area

15) Supplemental motor area is involved in all the following functions, except :-
a- adjusting posture
b- orienting responses
c- motor programming
d- coordinating bilateral movements

Section 9: Thalamus and Reticular Activating System

1) Specific thalamic nuclei include all the following, except :-
a- reticular nuclei
b- medial geniculate body
c- pulvinar
d- medial nuclei

2) The posteroventral nucleus of the thalamus projects to all the following centers, except :-
a- frontal motor areas
b- primary somatic sensory area
c- somatic sensory association area
d- parieto-occipito-temporal association area

3) The intralaminar thalamic nuclei produce :-
a- inhibition of cerebral cortex during sleep
b- inhibition of reticular activating system during sleep
c- activation of reticular activating system during wakefulness
d- activation of cerebral cortex during wakefulness

4) The reticular activating system is stimulated by all the following, except :-
a- epinephrine
b- serotonin
c- acetylcholine
d- norepinephrine

Section 10: Basal Ganglia

1) Basal ganglia include all the following, except :-
a- caudate nucleus
b- dentate nucleus
c- subthalamic nucleus
d- substantia nigra reticulate

2) Chemical transmitters in basal ganglia include all the following, except :-
a- GABA
b- Dopamine
c- Glutamate
d- Glycine

3) Functions of basal ganglia include all the following, except :-
a- planning and programming of voluntary movements
b- initiation of reflex movement.
c- postural regulation
d- executing learned pattern of movement.

4) Basal ganglia send direct projections to :-
a- primary motor area
b- premotor area
c- VA and VL thalamic nuclei
d- lower motor neurons in spinal cord

5) Parkinson's disease results from damage of :-
a- caudate nucleus
b- subthalamic nucleus
c- globus pallidus
d- substantia nigra

6) Manifestations of Parkinsonism include all the following except :-
a- kinetic tremors
b- rigidity
c- bradykinesia
d- disturbance of speech

Section 11: Cerebellum

1) Coordination of complex movements by the cerebellum involves all the following mechanisms, except :-
a- sequencing of movements
b- decomposition of movements
c- damping of movements
d- timing of movements

2) The cerebellum controls performance of rapid movements by :-
a- directly stimulating AHCs of the acting muscles
b- by storing pre-planed motor programs for these movements
c- by rapidly receiving proprioceptive information from the acting muscles
d- by inhibiting antagonistic muscles

3) Cerebellar ataxia is manifested by all the following, except :-
a- dysdiadochokinesia
b- static tremors
c- dysmetria
d- staccato speech

Section 12: Hypothalamus and Limbic System

1) The hypothalamus protects the body against hypoglycemia by :-
a- inhibiting insulin release
b- increasing glucagon release
c- increasing thyroxin release
d- increasing epinephrine release

2) The hypothalamic nucleus that act as a biological clock of the body is :-
a- supraoptic nucleus
b- preoptic nucleus

c- arcuate nucleus
d- suprachiasmatic nucleus

3) The role of the limbic system in control of emotional behavior involves all the following, except :-

a- homeostasis
b- somatic motor responses
c- consolidation of memory
d- generalized sympathetic stimulation

Section 13: Cerebral Cortex

1) β – waves of the EEG :-

a- are observed during relaxed wakeful state
b- are faster than α – waves but slower than theta waves
c- disappear when the person becomes alert
d- are observed during REM sleep

2) SW – sleep is characterized by :-

a- predominance of the slow α – waves in EEG
b- occurrence of dreams
c- irregularity of heart rate and respiratory rate
d- being a deep type of sleep

3) The prefrontal area is concerned with all the following, except :-

a- adjusting behavior
b- motor guidance within the surrounding environment
c- planning timing of movements
d- recall of memories

4) Damage of the general interpretative area causes all the following effects, except :-

a- failure of articulate speech
b- failure to understand written words
c- failure to understand spoken words
d- sensory aphasia

5) Lesions of the speech center in frontal lobe results in :-

a- paralysis of speech muscles

b- inability to select appropriate words for use in speech

c- inability to understand spoken language

d- failure of coordination of speech muscles

6) Retrogarde amnesia indicates :-

a- inability to consolidate memories

b- Inability to recall memories

c- Failure of working memory

d- Presence of lesions in the hippocampus

Answers Key

Section 1

1 - c 2 – a 3 – b

Section 2

1 – d 2- a 3 - b 4 – c 5 – d 6 – d 7 – d 8 – c
9 – d 10 – d 11 - b 12 – b

Section 3

1 - c 2 – c 3 – d 4 – b

Section 4

1 – d 2 - c 3 – a 4 - a 5 – b 6 – c 7 – b 8 – c 9 - a
10 - c
11 – a

Section 5

1 – a 2 - d 3 – a 4 – b 5 – c 6 – b 7 - b 8 – c 9 – c
10 – b 11 – d 12 – d 13 – a 14 – d 15 – c 16 – b 17 – b 18 – a
19 - d 20 – d 21 – a

Section 6

1 – c 2 – a

Section 7

1 - b 2 - d 3 – c 4 – c 5 – a 6 – d 7 – c 8 – d 9 – c
10 - c 11 - d 12 – d 13 - a 14 - c 15 – c 16 – c 17 – c 18 - d
19 – a 20 – b 21 – a 22 - d 23 – c 24 - b 25 – b 26 - a 27 - c
28 – d 29 - d 30 – d 31 – b 32 - c 33 – c 34 - c 35 – c 36 – d
37 – c 38 – c 39 – c 40 – d 41 – d 42 - c 43 – c 44 – b 45 - c
46 – b 47 – a 48 - c 49 - b 50 – a 51 – a 52 – d

Section 8

1 – b 2 - b 3 - c 4 – a 5 – b 6 – d 7 - b 8 - c 9 – b
10 – d 11 - c 12 - c 13 – a 14 – c 15 – b

Section 9

1 - a 2 – d 3 - d 4 – b

Section 10

1 – b 2 – d 3 - b 4 – c 5 – d 6 – a

Section 11

1 – b 2 - b 3 – b

Section 12

1 – d 2 – d 3 – c

Section 13

1 – d 2 – d 3 – c 4 – a 5 – d 6 - b

Scientific Committee of Batch 34 Human medicine

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